PROJECT DESIGN CRITERIA

I. PROJECT DESCRIPTION

Date: January 17, 2008

Project Name	**I-15 Corridor Study, Washington County MP 0 to 42**		
Project Number	**S-R499(48)**	PIN	**6361**

Describe the scope of the project: A corridor study for I-15 from the Arizona State Line (MP 0) in Washington County to the New Harmony Interchange (MP 42) in Washington County. The purpose of the project is to identify corridor needs and constraints, provide solutions, prioritize and develop a schedule for implementing those solutions, and provide concept reports for immediate projects. Projects identified will be included on the STIP. The time period for the corridor study includes analysis for the current year 2007 and the next 30 years (2040).

II. DESIGN STANDARDS BY ROADWAY (complete for each roadway on your project)

ROADWAY: I-15, MP 0.0 to MP 11.5

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**70 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	70 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft								
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504-505 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	2040 ft			Mainline					

I-15, MP 0.0 to MP 11.5 (continued)

12 Critical Elements	UDOT Standard			Proposed			Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value		Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Mainline	181	247	Mainline				
Profile Grades	% Min		% Max	% Min		% Max		AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5					
Stopping-Sight Distance	Minimum			Minimum				AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	730 ft		Mainline				
Cross Slope	Minimum							AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%							
Superelevation	Maximum Superelevation (UDOT Standard)							UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%							
Structural Capacity	Design Loading							Reference roadway design MOI, pg 288
	HS20 existing bridges HL-93 new structures							
Vertical Clearance*	Minimum							UDOT Roadway Design MOI p. 64
	16 feet 6 inches							
Bridge Width	Minimum							UDOT Roadway Design MOI p. 63
	Add 2 ft to travel way to each side of bridge							

I-15, MP 0.0 to MP 11.5 (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: I-15, MP 11.5 to MP 42

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**80 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	80 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft				.				
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	3050 ft			Mainline					
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value			AASHTO GB p. 272 & 277
	Mainline	231	384		Mainline					
Profile Grades	% Min		% Max		% Min		% Max			AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5							
Stopping-Sight Distance	Minimum				Minimum					AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	910 ft			Mainline					
Cross Slope	Minimum									AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%									
Superelevation	Maximum Superelevation (UDOT Standard)									UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%									

I-15, MP 11.5 to MP 42

12 Critical Elements	UDOT Standard	Proposed	Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Structural Capacity	Design Loading HS20 existing bridges HL-93 new structures			Reference roadway design MOI, pg 288
Vertical Clearance*	Minimum 16 feet 6 inches			UDOT Roadway Design MOI p. 64
Bridge Width	Minimum Add 2 ft to travel way to each side of bridge			UDOT Roadway Design MOI p. 63

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft (not in roadside table)			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General Off Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General Off Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	40 mph or less 14 ft to 16 ft 50 mph 18 ft to 20 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1 sideslope
Ramp Terminal Sight Distance	25 mph – 155 ft			AASHTO GB p. 828
Ramp Design	UDOT STD DWG DD 6			AASHTO GB p. 825+
Gores	UDOT STD DWG DD 6			AASHTO GB p. 832-837
Ramp Terminals	UDOT STD DWG DD 6			AASHTO GB p. 840-845
Ramp Entrances	UDOT STD DWG DD 6			AASHTO GB p. 845
Acceleration Lanes	AASHTO p. 847, 848			
Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General Off Ramp (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Guardrail Bridge Connection	N/A			
Sideslopes	6:1 in clear zone			UDOT STD DWG DD 4 AASHTO GB p. 326-329
Intersection Sight Distance	UDOT Roadway Design MOI p. 127-128 AASHTO GB p. 650-677			
Shoulder/Travel way (gutter pan)	Gutter pan not included in travelway or shoulder			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General On Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	**See attached**	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General On Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	40 mph or less 14 ft to 16 ft 50 mph 18 ft to 20 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1 sideslope
Ramp Terminal Sight Distance	25 mph – 155 ft			AASHTO GB p. 828
Ramp Design	UDOT STD DWG DD 6			AASHTO GB p. 825+
Gores	UDOT STD DWG DD 6			AASHTO GB p. 832-837
Ramp Terminals	UDOT STD DWG DD 6			AASHTO GB p. 840-845
Ramp Entrances	UDOT STD DWG DD 6			AASHTO GB p. 845
Acceleration Lanes	AASHTO p. 847, 848			
Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General On Ramp (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Guardrail Bridge Connection	N/A			
Sideslopes	6:1 in clear zone			UDOT STD DWG DD 4 AASHTO GB p. 326-329
Intersection Sight Distance	UDOT Roadway Design MOI p. 127-128 AASHTO GB p. 650-677			
Shoulder/Travel way (gutter pan)	Gutter pan not included in travelway or shoulder			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

Prepared by:_____ Phone Number:_____

Verified Only - Region Preconstruction Engineer:_____ Date:_____

Approved by Region Preconstruction Engineer, Consulting Engineer,
or Local Government Engineer:_____ Date:_____

Required Signatures

Local government projects require Regional Preconstruction Engineer signature for verification and the Local Government Engineer signature for approval.
Local government projects on State highway system require the Region Preconstruction Engineer signature for approval.
All other projects require Region Preconstruction Engineer signature for approval.

UTAH DEPARTMENT OF TRANSPORTATION
Region 4

CONCEPT REPORT
For

Safety Improvements

October 28, 2008

CONCEPT REPORT
Table of Contents

Table of Contents
Executive Summary
Concept Estimate
Roadway/Pavement Summary (Activities 54C, 58C)
Traffic and Safety Summary (Activity 64C)
Structure Summary (Activity 62C)
Environmental Summary (Activity 52C)
Right of Way Summary(Activity 56C)
Utility and Railroad Summary (Activity 68C)
ITS Summary (Activity 66C)
Public Involvement Summary (Activity 60C)

SECTION 1: General Information

Project Name:	**Safety Improvements**		
Project Manager:	**Kim Manwill**	**County:**	**Washington**
Pin Number:		**Begin Mile Post:**	**0**
Project Number:		**End Mile Post:**	**42.2**
Route Number:	**15**	**Design Year:**	**2010**
Functional Classification:	**Interstate**	**Design Speed:**	**Varies 70-80 mph**

Describe the Purpose/Need for this Project:

The purpose of this project is to perform fast, easy, and cost effective safety improvements to the corridor. The improvements are:

- Sign the deficient horizontal curves
- Making signing improvements at the Leeds Interchange
- Fix deficient horizontal sight distance
- Evaluate the deer fence at the Pintura Interchange

Horizontal curves have been identified as deficient at:

- SB at MP 0.1 and MP 0.3
- NB & SB at MP 14.5, MP 23.2, MP 23.6, and MP 34.8

These curves were designed for a 65 mph design speed. The accident data at most of these curves shows no accident clusters. Signing these curves will be a precaution to let drivers know of the speed of the curve is 60 mph.

The Leeds Interchange is in need of signing improvements to direct traffic to the proper ramp location. Also the South Leeds NB off-ramp needs signing to clarify the confusing merge with US-91, if the realignment as described in the I-15 Washington County Corridor Study is not fixed in 2010.

The horizontal sight distance is limited by vegetation growth at MP 34.8 and 37.3. This project will trim or remove the vegetation, so that the proper 910 ft of horizontal sight distance can be maintained around the horizontal curves.

Vehicle wildlife accidents have been identified at the Pintura Interchange (MP 32). Deer fence is currently located in the area; however an evaluation of the accident causes is needed along with a determination of any safety improvements to prevent further vehicle wildlife accidents.

Major Project Risks:

- Deficient Horizontal Curves – Not correcting all the horizontal curves to standard presents a safety risk. This can be mitigated by realigning the deficient curve with accident clusters and signing other deficient curves with speed advisory or other appropriate warning signs.

CONCEPT REPORT SUMMARY

Project Estimate and Timeline:

Planning Estimate:		**Proposed Construction FY:**	**2010**
Total Project Cost (Current Year):	**$45,100**	**Estimated Construction Duration:**	*< 1 year*
Construction Year Estimate (2011):	**$56,000**	**Recommended Commission Approved Amount:**	

Signature Block:

Project Manager **Date**	**Region Preconstruction Engineer** **Date**
Region STIP Workshop Chair **Date**	**Region Director** **Date**
Consultant **Date**	

SECTION 2: Design Information (Executive Summary)

Roadway / Pavement Summary (Activities 54C, 58C)	**Estimated Construction Cost:**	**$0**
Deficient horizontal curves and deficient horizontal sight distance was identified along the project. The solution will not be realigning, but signing and vegetation removal as accounted for in the Traffic and Safety Summary.		

Traffic and Safety Summary (Activity 64C)	**Estimated Construction Cost:**	**$56,000**
The horizontal curves will need a speed advisory sign (W1-2) with a supplemental speed advisory plaque (60 mph) (W13-1) placed prior to the curve. Leeds will need signing improvements to bring the existing signing up to standard and to clarify the ramp locations. Also the South Leeds NB off-ramp needs signing to clarify the confusing merge with US-91, if the realignment as described in the I-15 Washington County Corridor Study is not fixed in 2010. The horizontal sight distance is limited by vegetation growth at MP 34.8 and 37.3. This project will trim or remove the vegetation, so that the proper 910 ft of horizontal sight distance can be maintained around the horizontal curves. Vehicle wildlife accidents have been identified at the Pintura Interchange (MP 32). Deer fence is used in the area; however an evaluation of the accident causes is needed along with a determination of any safety improvements to prevent further vehicle wildlife accidents.		

Structures Summary (Activity 62C)	**Estimated Construction Cost:**	**$0**
No structural work to be completed with this project.		

Environmental Summary (Activity 52C)	**Estimated Mitigation Cost:**	**$0**
No environmental documentation is expected for this project. The project work will consist of maintenance performed within UDOT right-of-way and the current road footprint.		

Right of Way Summary (Activity 56C)	**Estimated Property Cost:**	**$0**
No Right-of-Way impacts or acquisition expected.		

CONCEPT REPORT SUMMARY

Utility and Railroad Summary (Activity 68C)	**Estimated Relocation Cost:**	**$0**
No utility or railroad conflicts expected.		

ITS Summary (Activity 66C)	**Estimated Construction Cost:**	**$0**
No ITS improvements are to be completed with this project.		

Public Involvement Summary (Activity 60C)	**Estimated Cost:**	**$0**
No public involvement plan is required. This project will be maintenance work completed on the side of the road.		

Miscellaneous Summary:

CONCEPT REPORT
Appendix A

SECTION 3: Project Log

Complete the Following:

Date Received	Deliverable
	Roadway/Pavement Summary (Activities 54C, 58C)
	Traffic and Safety Summary (Activity 64C)
	Structures Summary (Activity 62C)
	Environmental Summary (Activity 52C)
	Right of Way Summary (Activity 56C)
	Utility and Railroad Summary (Activity 68C)
	ITS Summary (Activity 66C)
	Public Involvement Summary (Activity 60C)

(Update this as major decisions are made regarding the project.)

Date	Decision Made
10/08	Preliminary Concept Report from I-15 Washington County Corridor Study

PIN ----- PROJECT # ----- Safety Improvements

Cost Estimate - Concept Level

Approximate Route Reference Post (BEGIN) =	0	(END) =	42.200	
Accumulated Mileage (BEGIN) =	0	(END) =	42.200	
Project Length =	42.200	miles	222,816 ft	
Current Year =	2007			
Assumed Construction Year =	2010			
Assumed Yearly Inflation for Construction and Utility Items (%/yr) =	7.0%	3 yrs for inflation		For projects 1 Year out use 10%, 2 Years 9%, 3
Assumed Yearly Inflation for Engineering Services (PE and CE) (%/yr) =	6.0%			
Assumed Yearly Inflation for Urban Residential Right of Way (%/yr) =	6.5%			
Assumed Yearly Inflation for Urban Commercial Right of Way (%/yr) =	4.0%			
Assumed Yearly Inflation for non-Urban Right of Way (%/yr) =	2.0%			
Construction Items Contingency (% of Construction) =	20.0%			10% Rural PB; 15% Urban PB; 20% Non PB
Preliminary Engineering (% of Construction + Incentives) =	8.0%			
Construction Engineering (% of Construction + Incentives) =	10.0%			

Item #					Cost	Remarks
Construction						
	Roadway and Drainage				$0	
	Traffic and Safety				$32,000	
	Structures				$0	
	Environmental Mitigation				$0	
	ITS				$0	
				Subtotal	$32,000	
	Construction Items Contingency (for minor items not listed)			(20%)	$6,400	
				Construction Subtotal	**$38,400**	
P.E. Cost				**P.E. Subtotal**	**$3,000**	8%
C.E. Cost				**C.E. Subtotal**	**$0**	10%
Right of Way Urban/Suburban Residential				**Right of Way Subtotal**	$0	
Right of Way Urban Suburban Commercial				**Right of Way Subtotal**	$0	
Right of Way non-Urban/Suburban				**Right of Way Subtotal**	$0	
Utilities				**Utilities Subtotal**	$0	
Incentives				**Incentives Subtotal**	$0	
Miscellaneous				**Miscellaneous Subtotal**	**$0**	

Cost Estimate (ePM screen 505)		2008		2010
Concept Report Cost				
P.E.		**$3,000**		**$4,000**
Right of Way		**$0**		**$0**
Utilities		**$0**		**$0**
Construction		**$38,000**		**$47,000**
C.E.		**$0**		**$0**
Incentives		**$0**		**$0**
Contingency	10%	**$4,100**		**$5,000**
Miscellaneous		**$0**		**$0**
	TOTAL	**$45,100**	**TOTAL**	**$56,000**

PROPOSED COMMISSION REQUEST	**TOTAL**	**$45,100**	**TOTAL**	**$56,000**

Cost Estimate Summary of Assumptions - Safety Improvements

Unit Weights			Application Rates	
Borrow	130	lb/cf		
Gran. Backfill Borrow	130	lb/cf		
Granular Borrow	135	lb/cf		
UTBC	135	lb/cf		
HMA	153	lb/cf		
OGSC	155	lb/cf		
Asphalt Cement	6.20%	OGSC		
Prime Coat	250	gal/ton	0.5	gal/sy
Tack Coat	240	gal/ton	0.08	gal/sy
Emulsified Asphalt LMCRS-2	250	gal/ton	0.4	gal/sy
Flush Coat	245	gal/ton	0.11	gal/sy
Water			42	gal/cy GB
			51	gal/cy UTBC
			45	gal/cy Borrow/Embank

Choose Either Ton or Vol
Manually Input

Water			
Material	Vol	gal	1,000 gal
	cy		
GB	0	0	0.0
UTBC	0	0	0.0
Borrow	0	0	0.0
Embankment	0	0	0.0
TOTAL			**0**

Oil									
Roadway	Prime Coat		Tack Coat			LMCRS-2		Flush Coat	
	Area	Tons	# of apps	Area	Tons	Area	Tons	Area	Tons
	sy			sy		sy		sy	
						0	0.0	0	0.0
						0	0.0	0	0.0
TOTALS		**0**			**0**		**0**		**0**

Pavements

Roadway	Length	Top Width	Side Slope	GB				UTBC				HMA			OGSC		Asphalt Cement	Chip Seal	4" LCBC		PCCP		Mill - ___"	
				Depth	Width	Vol	Tons	Depth	Width	Vol	Tons	Depth	Width	Tons	Depth	Tons			Width	Area	Depth	Area	Depth	Area
*Full Depth Work **(1 Side)**:*	ft	ft		in	ft	cy		in	ft	cy		in	ft		in		Tons	sy	ft	sy	in	sy	in	sy
Mill/Overlay Work:																								
TOTALS						**0**	**0**			**0**	**0**			**0**		**0**	**0**	**0**		**0**		**0**		**0**

Earthwork

Roadway	Roadway Excavation				Borrow					Granular Backfill Borrow				
	Length	Depth	Width	Vol	Length	Depth	Width	Vol	Tons	Length	Depth	Width	Vol	Tons
	ft	in	ft	cy	ft	in	ft	cy		ft	in	ft	cy	
				0				0	0				0	0
TOTALS				**0**				**0**	**0**				**0**	**0**

Roadway and Drainage - Safety Improvements

Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Roadway and Drainage						
012850010	Mobilization	0	$300,000.00	Lump	$0	10% of construction
013150010	Public Information Services	0	$20,000.00	Lump	$0	
015540005	Traffic Control	0	$150,000.00	Lump	$0	5% of construction
01557001*	Maintenance of Traffic	0	$20,000.00	Lump	$0	
015720010	Dust Control & Watering	0	$20.00	1000 gal	$0	
017210020	Survey	0	$30,000.00	Lump	$0	1% of construction
020560005	Borrow (Plan Quantity)	0	$15.00	Cu yd	$0	
020560010	Borrow	0	$8.00	Ton	$0	
020560015	Granular Borrow (Plan Quantity)	0	$17.00	Cu yd	$0	
020560020	Granular Borrow	0	$9.00	Ton	$0	
020560025	Granular Backfill Borrow (Plan Quantity)	0	$35.19	Cu yd	$0	
020560030	Granular Backfill Borrow	0	$10.00	Ton	$0	
022210015	Remove Bridge	0	$22,594.54	each	$0	
002210080	Remove Fence	0	$1.08	ft	$0	
022210095	Remove Pipe Culvert	0	$7.55	ft	$0	
023160020	Roadway Excavation (Plan Quantity)	0	$8.00	Cu yd	$0	
023310020	Clearing and Grubbing	0	$2,400.00	Acre	$0	
023730010	Loose Riprap	0	$48.74	Cu yd	$0	
027210070	Untreated Base Course 3/4 inch or 1 inch Max	0	$11.00	Ton	$0	
027210080	Untreated Base Course 3/4 inch or 1 inch Max (PQ)	0	$20.00	Cu yd	$0	
027410060	HMA - 3/4 Inch	0	$40.00	Ton	$0	
027480010	Liquid Asphalt MC-70 or MC-250	0	$350.00	Ton	$0	
027480030	Emulsified Asphalt SS-1	0	$250.00	Ton	$0	
027520020	Portland Cement Concrete Pavement 9 inch Thick	0	$27.82	Sq yd	$0	
027710025	Concrete Curb and Gutter Type B1	0	$14.00	ft	$0	
027760010	Concrete Sidewalk	0	$20.00	Sq yd	$0	
027850030	Chip Seal Coat, Type C	0	$1.00	Sq yd	$0	
027850060	Emulsified Asphalt LMCRS-2	0	$350.00	Ton	$0	
02785008*	Flush Coat	0	$250.00	Ton	$0	
	Open Graded Surface Course	0	$30.00	Ton	$0	
027860020	Asphalt Cement PG 64-34	0	$200.00	Ton	$0	
028220010	Right of Way Fence, Type A (Metal Post)	0	$4.00	ft	$0	
029120050	Strip, Stockpile, and Spread Topsoil	0	$0.77	Sq yd	$0	Assumed LxW
029220030	Broadcast Seed	0	$442.00	Acre	$0	Assumed LxW
029610050	Rotomilling	0	$1.00	Sq yd	$0	
026100032	24 Inch Pipe Culvert, Class C	0	$24.79	ft	$0	
026100034	24 Inch Pipe Culvert, Class C	0	$36.14	ft	$0	
026100038	36 Inch Pipe Culvert, Class C	0	$65.72	ft	$0	
026100042	48 Inch Pipe Culvert, Class C	0	$98.02	ft	$0	
	Catch Basin			each		
Roadway and Drainage Subtotal					**$0**	Back to Main

Traffic, Safety & ITS - Safety Improvements

Back to MAIN

	Item	Quantity	Price	Units	Cost	Remarks
Traffic, Safety & ITS						
Traffic						
	Signs	1	$20,000.00	Lump	$20,000	
	Remove Vegetation	1	$2,000.00	Lump	$2,000	
	Evaluate Fence	1	$10,000.00	Lump	$10,000	
Signals						
Lighting						
	Highway Lighting System			Each		
Traffic and Safety Subtotal					**$32,000**	
ITS						
	Multiduct Conduit	0	$50,000.00	Lump	$0	
ITS Subtotal					**$0**	Back to MAIN

Structures - Safety Improvements

Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Structures						
Bridges						
	New Structure	0	$100.00	sq ft	$0	Assumed LxW (deck area)
	Bridge Rehab	0	$200.00		$0	
Walls						
	Retaining Wall	0	$50.00	Sq ft	$0	Assumed LxH (wall area)
				ft		
Hydraulics						
	Extend Box Culvert	0	$200.00	ft	$0	
	New Box Culvert					
	Scour Mitigation					
Geotech						
	Geotech Report	0	$25,000.00	Lump	$0	
	Drilling	0	$25,000.00	Lump	$0	
Structures Subtotal					**$0**	Back to MAIN

Environmental and Landscaping - Safety Improvements

Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Environmental & Landscaping						
Environmental						
	Wetland Mitigation	0	$50,000.00	Lump	$0	
	Noise Wall	0	$1,000.00	ft	$0	
Temporary Erosion Control						
	Silt Fence	0	$20.00	Ft	$0	
	Erosion Control Supervisor	0	$20,000.00	Lump	$0	
	Check Dams	0	$250.00	Each	$0	
Landscaping						
	Contractor Furnished Topsoil			sq ft		
	Strip, Stockpile, Spread Topsoil			sq ft		
	Wood Fiber Mulch			acre		
	Broadcast Seed			acre		
	Drill Seed			acre		
Environmental Mitigation Subtotal					$0	Back to MAIN

Miscellaneous - Safety Improvements

Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Utilities						
	Relocate Water Line	0	$500.00	Lump	$0	
	Relocate Gas Line	0	$50,000.00	Lump	$0	
	Relocate Power Line			Lump		
	Relocate Fiber Optic			Lump		
	Relocate Phone			Lump		
	S.U.E	0	$20,000.00	Lump	$0	Assume $1.00 per foot per utility
Utilities Subtotal					**$0**	
Right-of-way						
	Urban/Suburban Residential	0	$5.00	sq ft	$0	Wasatch Front/Cache Valley/Cedar City/ Saint George areas
	Urban/Suburban Commercial	0	$15.00	sq ft	$0	Wasatch Front/Cache Valley/Cedar City/ Saint George areas
	non-Urban/Suburban Residential	0	$5.00	sq ft	$0	
	non-Urban/Suburban Commercial	0	$15.00	sq ft	$0	
	non-Urban/Suburban Farm	0	$1.00	sq ft	$0	
Right-of-Way Subtotal					**$0**	
Incentives						
	HMA Properties	0	$2.00	ton	$0	Max $2.31per ton of HMA
	Smoothness	5%	$0.00	lump	$0	% of HMA cost
	OGSC Properties	0	$1.75	ton	$0	Max $1.83 per ton of OGSC
	Lane Rental Incentive	0	$10,000.00	Lump	$0	
	Early Completion	0	$50,000.00	Lump	$0	
Incentives Subtotal					**$0**	
						Back to MAIN

Roadway / Pavement Summary (Activity 54C, 58C)

The deficiencies of the corridor were defined from the Project Design Criteria, located at the end of the appendix. The following is a summary of only the deficiencies that this project is addressing. For a full account of all corridor deficiencies for the I-15 Washington County Corridor Study, see the Existing Conditions Report.

Horizontal Alignment

The minimum horizontal curve radius for an 80 mph design speed is 3050 ft. I-15 was originally designed with a 65 mph design speed. With the increase in the speed limit several horizontal curves have become deficient. A summary of the deficient horizontal alignments and superelevations can be seen in the table below.

Deficient Horizontal Alignment

Direction	MP	Existing Radius (feet)	Existing Superelevation (e)	Notes
SB	0.02	2864.95	4.9	65 mph design speed
SB	0.33	2864.79	4.9	65 mph design speed
NB & SB	14.54	2291.8	5.5	65 mph design speed
NB & SB	23.22	2864.93	5.5	65 mph design speed
NB & SB	23.62	2864.93	4.9	65 mph design speed
NB & SB	34.75	2864.90	4.9	65 mph design speed
NB & SB	37.50	2292.00	5.5	65 mph design speed

The solution will not be realigning, but signing as seen in the Traffic and Safety Summary below. All the horizontal curves are to be signed with this project, except the curve at MP 37.5. This curve is to be addressed in the Black Ridge Curve and Northern Interchange project as identified in the I-15 Washington County Corridor Study.

Horizontal Sight Distance

The design stopping sight distance for the project is 910 ft for an 80 mph design speed. The table below summarizes the locations with deficient sight distance.

Deficient Stopping Sight Distance

Direction	From	To	Notes
NB	23.1	23.3	NB sight distance is limited by cut wall
SB	34.8	35	SB vegetation blocking view
SB	37.3	37.5	SB vegetation blocking view

The sight distance at MP 23.3 will be corrected with the Improve North and South Leeds Interchange project as identified in the I-15 Washington County Corridor Study. The other deficient sight distance locations will be corrected with this project.

Pavement Design
No pavement work is associated with this project.

Traffic and Safety Summary (Activity 64C)

To be completed by the Region traffic engineer. The expected traffic and safety work for the project is to sign the deficient horizontal curves, making signing improvements to the Leeds split diamond interchange, improve the horizontal sight distance, and evaluate the deer fence at the Pintura Interchange.

The horizontal curves will need a speed advisory sign (W1-2) with a supplemental speed advisory plaque (W13-1) added to the following deficient curves.

- Sign SB Curves @ MP 0.1 and 0.3 to 60 mph
- Sign Curve @ MP 14.53 to 60 mph
- Sign Curve @ MP 23.15 to 60 mph
- Sign Curve @ MP 23.54 to 60 mph
- Sign Curve @ MP 34.75 to 60 mph

The deficient horizontal curve at MP 37.5 is to be realigned or signed with ground-mounted speed display signing this same year. This work will be taken care of in the Black Ridge Curve and Northern Interchange project as identified in the I-15 Washington County Corridor Study.

The Leeds Interchange will need signing improvements to direct traffic to the proper ramp location. Also the South Leeds NB off-ramp needs signing to clarify the confusing merge with US-91, if the realignment as described in the I-15 Washington County Corridor Study is not fixed in 2010.

The sight distance is limited by vegetation growth in two locations. This project will trim or remove the vegetation, so that the proper 910 ft of sight distance can be maintained around the horizontal curves. The locations of those deficient curves are:

- MP 34.8
- MP 37.3

Vehicle wildlife crashes have been identified at the Pintura Interchange (MP 32). The Division of Wildlife Resources (DWR) believes the most likely cause of the vehicle wildlife accidents is a breach in the fence, or the deer are able to improperly cross the interchange. An evaluation of the accident causes is needed along with a determination of any safety improvements to prevent further vehicle wildlife accidents.

Structures Summary (Activity 62C)

No structural work to be completed with this project.

Environmental Summary (Activity 52C)

No environmental documentation is expected for this project. The project work will consist of maintenance performed within UDOT right-of-way and the current road footprint.

Right of Way Summary (Activity 56C)

No Right-of-Way impacts or acquisition expected.

Utility and Railroad Summary (Activity 68C)

No utility or railroad conflicts expected.

ITS Summary (Activity 66C)

No ITS improvements are to be completed with this project

Public Involvement Summary (Activity 60C)

No public involvement plan is required. This project will be maintenance work completed on the side of the road.

PROJECT DESIGN CRITERIA

I. PROJECT DESCRIPTION

Date: January 17, 2008

Project Name	**I-15 Corridor Study, Washington County MP 0 to 42**		
Project Number	**S-R499(48)**	PIN	**6361**

Describe the scope of the project: A corridor study for I-15 from the Arizona State Line (MP 0) in Washington County to the New Harmony Interchange (MP 42) in Washington County. The purpose of the project is to identify corridor needs and constraints, provide solutions, prioritize and develop a schedule for implementing those solutions, and provide concept reports for immediate projects. Projects identified will be included on the STIP. The time period for the corridor study includes analysis for the current year 2007 and the next 30 years (2040).

II. DESIGN STANDARDS BY ROADWAY (complete for each roadway on your project)

ROADWAY: I-15, MP 0.0 to MP 11.5

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**70 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	70 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft								
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504-505 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	2040 ft			Mainline					

I-15, MP 0.0 to MP 11.5 (continued)

12 Critical Elements	UDOT Standard			Proposed			Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value		Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Mainline	181	247	Mainline				
Profile Grades	% Min		% Max	% Min		% Max		AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5					
Stopping-Sight Distance	Minimum			Minimum				AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	730 ft		Mainline				
Cross Slope	Minimum							AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%							
Superelevation	Maximum Superelevation (UDOT Standard)							UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%							
Structural Capacity	Design Loading							Reference roadway design MOI, pg 288
	HS20 existing bridges HL-93 new structures							
Vertical Clearance*	Minimum							UDOT Roadway Design MOI p. 64
	16 feet 6 inches							
Bridge Width	Minimum							UDOT Roadway Design MOI p. 63
	Add 2 ft to travel way to each side of bridge							

I-15, MP 0.0 to MP 11.5 (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: I-15, MP 11.5 to MP 42

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**80 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	80 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft				.				
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	3050 ft			Mainline					
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value			AASHTO GB p. 272 & 277
	Mainline	231	384		Mainline					
Profile Grades	% Min		% Max		% Min		% Max			AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5							
Stopping-Sight Distance	Minimum				Minimum					AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	910 ft			Mainline					
Cross Slope	Minimum									AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%									
Superelevation	Maximum Superelevation (UDOT Standard)									UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%									

I-15, MP 11.5 to MP 42

12 Critical Elements	UDOT Standard	Proposed	Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Structural Capacity	Design Loading HS20 existing bridges HL-93 new structures			Reference roadway design MOI, pg 288
Vertical Clearance*	Minimum 16 feet 6 inches			UDOT Roadway Design MOI p. 64
Bridge Width	Minimum Add 2 ft to travel way to each side of bridge			UDOT Roadway Design MOI p. 63

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft (not in roadside table)			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General Off Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General Off Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	40 mph or less 14 ft to 16 ft 50 mph 18 ft to 20 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1 sideslope
Ramp Terminal Sight Distance	25 mph – 155 ft			AASHTO GB p. 828
Ramp Design	UDOT STD DWG DD 6			AASHTO GB p. 825+
Gores	UDOT STD DWG DD 6			AASHTO GB p. 832-837
Ramp Terminals	UDOT STD DWG DD 6			AASHTO GB p. 840-845
Ramp Entrances	UDOT STD DWG DD 6			AASHTO GB p. 845
Acceleration Lanes	AASHTO p. 847, 848			
Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General Off Ramp (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Guardrail Bridge Connection	N/A			
Sideslopes	6:1 in clear zone			UDOT STD DWG DD 4 AASHTO GB p. 326-329
Intersection Sight Distance	UDOT Roadway Design MOI p. 127-128 AASHTO GB p. 650-677			
Shoulder/Travel way (gutter pan)	Gutter pan not included in travelway or shoulder			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General On Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	**See attached**	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General On Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	40 mph or less 14 ft to 16 ft 50 mph 18 ft to 20 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1 sideslope
Ramp Terminal Sight Distance	25 mph – 155 ft			AASHTO GB p. 828
Ramp Design	UDOT STD DWG DD 6			AASHTO GB p. 825+
Gores	UDOT STD DWG DD 6			AASHTO GB p. 832-837
Ramp Terminals	UDOT STD DWG DD 6			AASHTO GB p. 840-845
Ramp Entrances	UDOT STD DWG DD 6			AASHTO GB p. 845
Acceleration Lanes	AASHTO p. 847, 848			
Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General On Ramp (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Guardrail Bridge Connection	N/A			
Sideslopes	6:1 in clear zone			UDOT STD DWG DD 4 AASHTO GB p. 326-329
Intersection Sight Distance	UDOT Roadway Design MOI p. 127-128 AASHTO GB p. 650-677			
Shoulder/Travel way (gutter pan)	Gutter pan not included in travelway or shoulder			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

Prepared by:_____ Phone Number:_____

Verified Only - Region Preconstruction Engineer:_____ Date:_____

Approved by Region Preconstruction Engineer, Consulting Engineer,
or Local Government Engineer:_____ Date:_____

Required Signatures

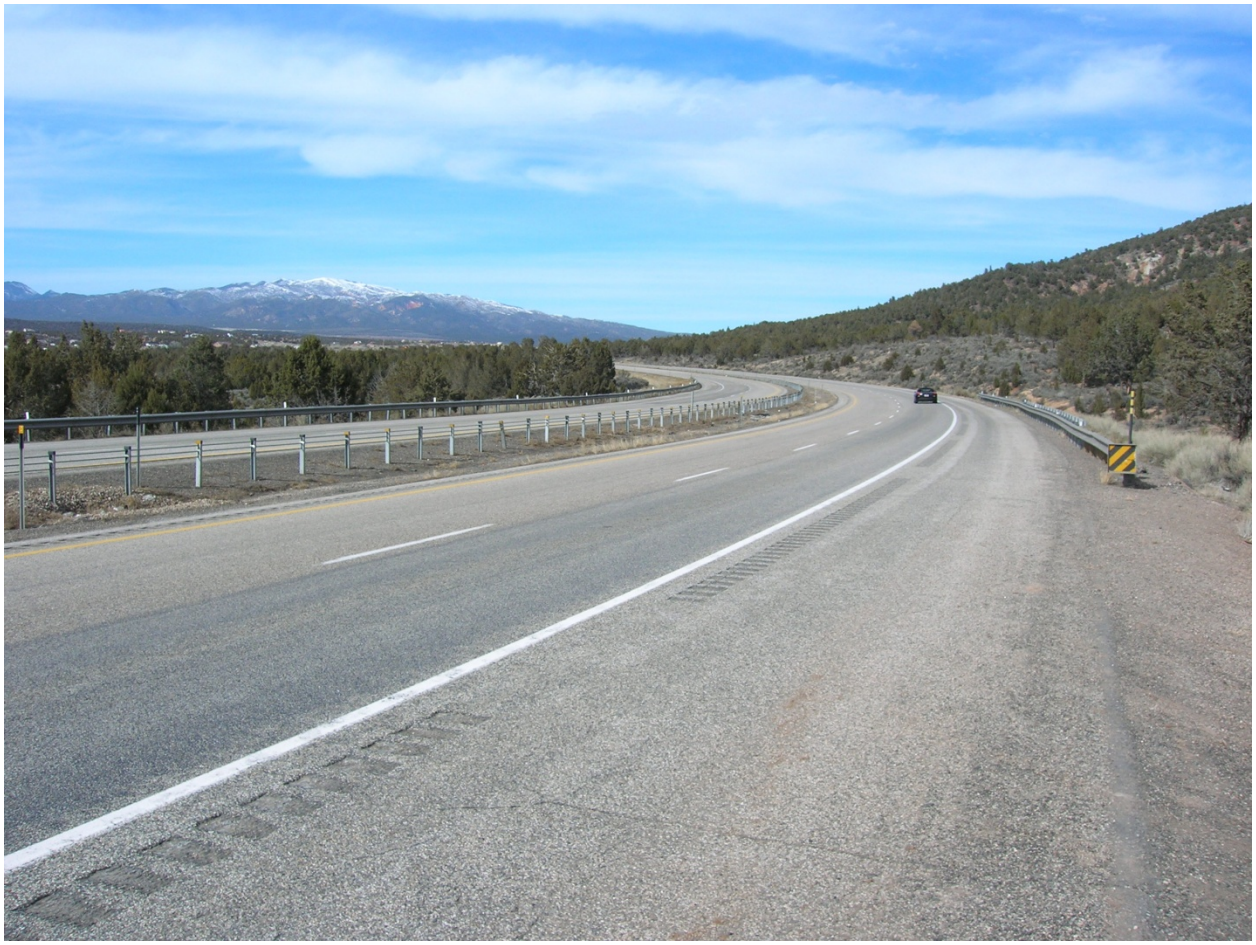
Local government projects require Regional Preconstruction Engineer signature for verification and the Local Government Engineer signature for approval.
Local government projects on State highway system require the Region Preconstruction Engineer signature for approval.
All other projects require Region Preconstruction Engineer signature for approval.

UTAH DEPARTMENT OF TRANSPORTATION
Region 4

CONCEPT REPORT
For

Improve Black Ridge Curve and Northern Interchanges

October 28, 2008



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Right of Way Summary(Activity 56C)
Utility and Railroad Summary (Activity 68C)
ITS Summary (Activity 66C)
Public Involvement Summary (Activity 60C)

SECTION 1: General Information

Project Name:	**Improve Black Ridge Curve and Northern Interchanges**		
Project Manager:	**Kim Manwill**	**County:**	**Washington**
Pin Number:		**Begin Mile Post:**	**34.3**
Project Number:		**End Mile Post:**	**42.2**
Route Number:	**15**	**Design Year:**	**2010**
Functional Classification:	**Interstate**	**Design Speed:**	**80 mph**

Describe the Purpose/Need for this Project:

The purpose of this project is to address an accident cluster at MP 37.5 and to lengthen the deficient acceleration and deceleration lengths. An accident cluster was identified at the top of the Black Ridge at the deficient horizontal curve, MP 37.5. By realigning the curve and bringing it up to an 80 mph design speed, the number and severity of accidents is expected to be reduced.

Deficient acceleration and deceleration lengths were identified on all of interchanges from MP 34 to 42. Some of the interchanges had deficient exit and entrance tapers. This project will add the necessary length to each ramp and bring the entrance and exit taper rates up to standard.

Major Project Risks:

- If funding is unavailable to realign the horizontal curve in 2010. A mitigation strategy would be to place ground mounted speed display signing and overhead signing to warn motorists of the curve speed. It would also construct a Road Weather Information System and overhead signing for use during poor weather to warn motorist of hazardous road conditions on Black Ridge and to advise truckers to use chain-up areas. The approximate cost of signing, variable message signs (VMS) and RWIS is $1,000,000.
- Oil Cost Escalation- Pavement costs make up the bulk of this projects budget. To mitigate the cost of pavement, a standard 10% contingency has used.

Project Estimate and Timeline:

Planning Estimate:		**Proposed Construction FY:**	**2010**
Total Project Cost (Current Year):	**$15,854,000**	**Estimated Construction Duration:**	*1 year*
Construction Year Estimate (2011):	**$18,101,000**	**Recommended Commission Approved Amount:**	

Signature Block:

Project Manager **Date**	**Region Preconstruction Engineer** **Date**
Region STIP Workshop Chair **Date**	**Region Director** **Date**

CONCEPT REPORT SUMMARY

Consultant	**Date**

SECTION 2: Design Information (Executive Summary)

Roadway / Pavement Summary (Activities 54C, 58C)	**Estimated Construction Cost:**	**$11,056,000**
Of the deficiencies on the project the horizontal alignment at MP 37.5 and the ramp deficiencies will be fixed with this project. The horizontal alignment at MP 34.75, superelevation, stopping sight distance, clear zone, and guardrail will be fixed by other projects as identified in the I-15 Washington County Corridor Study. The vertical alignments will not be brought to standard, because no accident cluster was associated with any of the deficiencies. Design exceptions will be needed for the vertical and horizontal alignments. All pavement placed will be full depth pavement, consisting of 12" GB, 8.5" UTBC, 9.5" HMA, and 1.5" SMA.		

Traffic and Safety Summary (Activity 64C)	**Estimated Construction Cost:**	**$1,261,000**
Safety improvements for the project include realigning the deficient horizontal curve at MP 37.5 and improving all interchange ramps. Other traffic and safety work consist of replacing the cable barrier, at the deficient horizontal curve, with a permanent barrier when the curve is realigned.		

Structures Summary (Activity 62C)	**Estimated Construction Cost:**	**$0**
No structural work is planned for this project.		

Environmental Summary (Activity 52C)	**Estimated Mitigation Cost:**	**$0**
A significant number of cultural sites can be expected in this area. A cultural inventory within the project area will be needed to determine the extent of cultural sites in the area. Several sensitive species have been identified as having potential habitat within 0.5 mile of the corridor. These are Utah Prairie Dog, Bald Eagle, and California Condor. Survey will be required to determine if these species have habitat near the corridor. Mitigation would include limited construction during nesting season and silt fencing for the Utah Prairie Dogs. The Mexican Spotted Owl has designated critical habitat within 0.5 mile of the corridor. The Mexican Spotted Owl will require survey to be preformed 2 years prior to construction. The Mitigation plan would be to discourage the owls from nesting or to avoid construction during the nesting season March through August. The environmental documentation cost has been included in the PE cost in the cost estimate.		

Right of Way Summary (Activity 56C)	**Estimated Property Cost:**	**$0**
There is potential impact to the right-of-way from realigning the deficient horizontal curve, although it is anticipated that it can be avoided. Preliminary engineering will be needed to determine if there will be an impact and the extent of that impact. No cost was added to the project total for right-of-way purchases.		

Utility and Railroad Summary (Activity 68C)	**Estimated Relocation Cost:**	**$0**
No utility or railroad conflicts expected.		

ITS Summary (Activity 66C)	**Estimated Construction Cost:**	**$0**
No ITS implementation on this project. However, if the option to realign the curve is not selected, but signing the curve is selected instead, ITS will be recommended (for more information see the I-15 Washington County Corridor Study). The ITS work will involve constructing a RWIS with VMS.		

Public Involvement Summary (Activity 60C)	**Estimated Cost:**	**$15,000**
The public involvement plan is to coordinate with local municipalities, Port of Entry, Truckers Association, Tourism Bureau, and local media, on project construction schedule and traffic impacts.		

Miscellaneous Summary:

This project is to be designed in coordination of the other projects in the area as identified in the I-15 Washington County Corridor Study. The three projects to be considered are, Improve Black Ridge Curve and Northern Interchanges, Pavement Rehabilitation (MP 34 to 42), and Climbing Lane (MP 34 to 37). Consideration should be given to add as many additional pieces of the Improve Black Ridge Curve and Northern Interchanges and Climbing Lane (MP 34 to 37) projects to the Pavement Rehabilitation (MP 34 to 42) project. Those project elements include adding acceleration and deceleration lengths to Interchanges 36, 40, and 42, add a climbing lane MP 34 to 37, and realigning the deficient curve at MP 37.5.

The total construction cost includes concept report cost, PE, CE, and a 10% project contingency. See the Concept Estimate following this summary.

SECTION 3: Project Log

Complete the Following:

Date Received	Deliverable
	Roadway/Pavement Summary (Activities 54C, 58C)
	Traffic and Safety Summary (Activity 64C)
	Structures Summary (Activity 62C)
	Environmental Summary (Activity 52C)
	Right of Way Summary (Activity 56C)
	Utility and Railroad Summary (Activity 68C)
	ITS Summary (Activity 66C)
	Public Involvement Summary (Activity 60C)

(Update this as major decisions are made regarding the project.)

Date	Decision Made
10/08	Preliminary Concept Report from I-15 Washington County Corridor Study

PIN ----- PROJECT # ----- Improve Black Ridge Curve and Northern Interchanges

Cost Estimate - Concept Level

Approximate Route Reference Post (BEGIN) =	34.3	(END) =	42.2	
Accumulated Mileage (BEGIN) =	34.3	(END) =	42.2	
Project Length =	7.900	miles	41,712 ft	
Current Year =	2008			
Assumed Construction Year =	2010			
Assumed Yearly Inflation for Construction and Utility Items (%/yr) =	7.0%	2 yrs for inflation		For projects 1 Year out use 10%, 2 Years 9%,
Assumed Yearly Inflation for Engineering Services (PE and CE) (%/yr) =	6.0%			
Assumed Yearly Inflation for Urban Residential Right of Way (%/yr) =	6.5%			
Assumed Yearly Inflation for Urban Commercial Right of Way (%/yr) =	4.0%			
Assumed Yearly Inflation for non-Urban Right of Way (%/yr) =	2.0%			
Construction Items Contingency (% of Construction) =	10.0%			10% Rural PB; 15% Urban PB; 20% Non PB
Preliminary Engineering (% of Construction + Incentives) =	8.0%			
Construction Engineering (% of Construction + Incentives) =	10.0%			

Item #					Cost	Remarks
Construction						
	Roadway and Drainage				$9,657,123	
	Traffic and Safety				$1,101,671	
	Structures				$0	
	Environmental Mitigation				$0	
	ITS				$0	
				Subtotal	$10,758,794	
			Construction Items Contingency (for minor items not listed)	(10%)	$1,075,879	
				Construction Subtotal	**$11,834,673**	
P.E. Cost				**P.E. Subtotal**	**$946,774**	8%
C.E. Cost				**C.E. Subtotal**	**$1,221,000**	10%
Right of Way Urban/Suburban Residential				**Right of Way Subtotal**	$0	
Right of Way Urban Suburban Commercial				**Right of Way Subtotal**	$0	
Right of Way non-Urban/Suburban				**Right of Way Subtotal**	$0	
Utilities				**Utilities Subtotal**	$0	
Incentives				**Incentives Subtotal**	$380,324	
Miscellaneous				**Miscellaneous Subtotal**	**$0**	

Cost Estimate (ePM screen 505)		2008		2010	
Concept Report Cost	**0.25%**	**$30,000**		**$30,000**	includes cost for cultural and environmental su
P.E.		**$946,774**		**$1,063,795**	
Right of Way		**$0**		**$0**	
Utilities		**$0**		**$0**	
Construction		**$11,834,673**		**$13,549,517**	
C.E.		**$1,221,000**		**$1,371,916**	
Incentives		**$380,324**		**$435,432**	
Contingency	**10%**	**$1,441,277**		**$1,650,118**	
Miscellaneous		**$0**		**$0**	
	TOTAL	**$15,854,000**	**TOTAL**	**$18,101,000**	

PROPOSED COMMISSION REQUEST	**TOTAL**	**$15,854,000**	**TOTAL**	**$18,101,000**

Cost Estimate Summary of Assumptions - Improve Black Ridge Curve and Northern Interchanges

Unit Weights			Application Rates	
Borrow	133	lb/cf		
Gran. Backfill Borrow	133	lb/cf		
Granular Borrow	133	lb/cf		
UTBC	136	lb/cf		
HMA	152	lb/cf		
SMA	149	lb/cf		
Asphalt Cement	6.20%	OGSC		
Prime Coat	250	gal/ton	0.5	gal/sy
Tack Coat	240	gal/ton	0.08	gal/sy
Emulsified Asphalt LMCRS-2	250	gal/ton	0.4	gal/sy
Flush Coat	245	gal/ton	0.11	gal/sy
Water			42	gal/cy GB
			51	gal/cy UTBC
			45	gal/cy Borrow/Embank

Choose Either Ton or Vol
Manually Input

Water			
Material	Vol cy	gal	1,000 gal
GB	34457	1E+06	1447.2
UTBC	0	0	0.0
Borrow	13588	611460	611.5
Embankment	2000	90000	90.0
TOTAL			2149

Oil									
Roadway	Prime Coat		Tack Coat			LMCRS-2		Flush Coat	
	Area sy	Tons	# of apps	Area sy	Tons	Area sy	Tons	Area sy	Tons
ack Ridge realign curve	35797	71.6	0	32193	0.0				
ack Ridge realign curve	35797	71.6	0	32193	0.0				
			0						
			0			0	0.0	0	0.0
			0			0	0.0	0	0.0
TOTALS		144			0		0		0

Pavements

Roadway	Length	Top Width	Side Slope	GB				UTBC				HMA			SMA		Asphalt Cement	Chip Seal	4" LCBC		PCCP		Mill - ___"	
				Depth	Width	Vol	Tons	Depth	Width	Vol	Tons	Depth	Width	Tons	Depth	Tons			Width	Area	Depth	Area	Depth	Area
*Full Depth Work **(1 Side)**:*	ft	ft		in	ft	cy		in	ft	cy		in	ft		in		Tons	sy	ft	sy	in	sy	in	sy
Black Ridge realign curve NB	6340	43	1/6	12	56.6	13300	23881	8.5	50.8	8452	15518	9.5	45.7	17433	1.5	2539								
Black Ridge realign curve SB	6340	43	1/6	12	56.6	13300	23881	8.5	50.8	8452	15518	9.5	45.7	17433	1.5	2539								
Ranch Exit 36 (3)Ramps	3210	10	1/6	12	23.6	2811	5047	8.5	17.8	1500	2755	9.5	12.7	2453	1.5	299								
Kolob Canyon 4 Ramps	3260	10	1/6	12	23.6	2854	5125	8.5	17.8	1524	2797	9.5	12.7	2491	1.5	304								
New Harmony 2 Ramps	1865	10	1/6	12	23.6	1633	2932	8.5	17.8	872	1600	9.5	12.7	1425	1.5	174								
Ranch Exit 36 SB off	400	24	1/6	12	37.6	558	1001	8.5	31.8	334	613	9.5	26.7	643	1.5	89								
Mill/Overlay Work:																								
TOTALS						34457				38802				41877		5944	0	0		0		0		0

Earthwork

Roadway	Roadway Excavation				Borrow					Granular Backfill Borrow				
	Length	Depth	Width	Vol	Length	Depth	Width	Vol	Tons	Length	Depth	Width	Vol	Tons
	ft	in	ft	cy	ft	in	ft	cy		ft	in	ft	cy	
Black Ridge realign curve NB	6340	32	43	26925					0				0	0
Black Ridge realign curve SB	6340	32	43	26925					0				0	0
Ranch Exit 36 (3)Ramps					3210	36.00	14	4993	0				0	0
Kolob Canyon 4 Ramps					3260	36.00	14	5071	0				0	0
New Harmony 2 Ramps					1865	36.00	14	2901	0				0	0
Ranch Exit 36 SB off					400	36.00	14	622	0				0	0
TOTALS				53851				13588	0				0	0

Fill
Ramps

Assumptions
clear zone 20 -6 = 14 ft
Depth assumed 3 ft average

cross sections	inside shldr	lane width	outside shldr	barrier offset	barrier plus 1 ft	used existing shoulder	total
Black Ridge realign curve	4	24	10	2	3		43
Ramps	0	12	6			-10	8
Ranch Exit 36 SB off	4	14	6				24

Roadway and Drainage - Improve Black Ridge Curve and Northern Interchanges

Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Roadway and Drainage						
012850010	Mobilization	1	$1,100,000.00	Lump	$1,100,000	10% of construction
013150010	Public Information Services	1	$15,000.00	Lump	$15,000	
015540005	Traffic Control	1	$550,000.00	Lump	$550,000	5% of construction
01557001*	Maintenance of Traffic	0	$0.00	Lump	$0	
015720010	Dust Control & Watering	2149	$25.00	1000 gal	$53,725	
017210020	Survey	1	$105,000.00	Lump	$105,000	1% of construction
020560005	Borrow (Plan Quantity)	13588	$15.00	Cu yd	$203,820	
020560010	Borrow	0	$8.00	Ton	$0	
020560015	Granular Borrow (Plan Quantity)	34457	$17.00	Cu yd	$585,769	
020560025	Granular Backfill Borrow (Plan Quantity)	0	$35.19	Cu yd	$0	
020560030	Granular Backfill Borrow	0	$10.00	Ton	$0	
022210015	Remove Bridge	0	$22,594.54	each	$0	
002210080	Remove Fence	0	$1.08	ft	$0	
022210095	Remove Pipe Culvert	0	$20.00	ft	$0	
023160020	Roadway Excavation (Plan Quantity)	53851	$12.00	Cu yd	$646,212	
023310020	Clearing and Grubbing	0	$2,400.00	Acre	$0	
023730010	Loose Riprap	0	$90.00	Cu yd	$0	
027210070	Untreated Base Course 3/4 inch or 1 inch Max	38802	$23.50	Ton	$911,847	
027410060	HMA - 3/4 Inch	41877	$110.00	Ton	$4,606,470	
027480010	Liquid Asphalt MC-70 or MC-250	166	$1,000.00	Ton	$166,000	
027480030	Emulsified Asphalt SS-1	0	$250.00	Ton	$0	
027520020	Portland Cement Concrete Pavement 9 inch Thick	0	$27.82	Sq yd	$0	
027710025	Concrete Curb and Gutter Type B1	0	$14.00	ft	$0	
027760010	Concrete Sidewalk	0	$20.00	Sq yd	$0	
027850030	Chip Seal Coat, Type C	0	$1.00	Sq yd	$0	
027850060	Emulsified Asphalt LMCRS-2	0	$350.00	Ton	$0	
02785008*	Flush Coat	0	$250.00	Ton	$0	
02744000*	SMA - 1/2 inch	5944	$120.00	Ton	$713,280	
027860020	Asphalt Cement PG 64-34	0	$200.00	Ton	$0	
028220010	Right of Way Fence, Type G (Deer Fence)	0	$4.00	ft	$0	
029120050	Strip, Stockpile, and Spread Topsoil	0	$1.00	Sq yd	$0	Assumed LxW
029220010	Drill Seed	0	$470.00	Acre	$0	Assumed LxW
029610050	Rotomilling	0	$4.50	Sq yd	$0	
026100032	24 Inch Pipe Culvert, Class C	0	$24.79	ft	$0	
026100034	24 Inch Pipe Culvert, Class C	0	$36.14	ft	$0	
026100038	36 Inch Pipe Culvert, Class C	0	$65.72	ft	$0	
026100042	48 Inch Pipe Culvert, Class C	0	$98.02	ft	$0	
029620010	In-Place Cold Recycled Asphaltic Base	0	$2.60	Sq yd	$0	
Roadway and Drainage Subtotal					**$9,657,123**	Back to Main

Traffic, Safety & ITS - Improve Black Ridge Curve and Northern Interchanges

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	Item	Quantity	Price	Units	Cost	Remarks
Traffic, Safety & ITS						
Traffic						
	W-Beam Guardrail	0	$22.00	ft	$0	
	Crash Cushion Type G	2	$3,000.00	Each	$6,000	
	Concrete Barrier (New Jersey Shape)	12680	$50.00	ft	$634,000	median barrier for NB and SB to accommodate a split profile
	Pavement Marking Paint	38903	$0.30	ft	$11,671	
	Pavement Message Paint	0	$0.00	Each	$0	
	Signs	0	$120,000.00	Lump	$0	
Signals						
Lighting						
	Highway Lighting System	3	$150,000.00	Each	$450,000	1 system per interchange
Traffic and Safety Subtotal					**$1,101,671**	
ITS						
	Multiduct Conduit	0	$50,000.00	Lump	$0	
ITS Subtotal					**$0**	Back to MAIN

Structures - Improve Black Ridge Curve and Northern Interchanges

Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Structures						
Bridges						
	Structure Maintenance	0	$100,000.00		$0	
	Widen or Replace Ash Creek Culvert	0	$200,000.00		$0	
	Widen or Replace Dry Creek Culvert	0	$200,000.00		$0	
Walls						
	Retaining Wall	0	$50.00	Sq ft	$0	Assumed LxH (wall area)
				ft		
Hydraulics						
	Extend Box Culvert	0	$200.00	ft	$0	
	New Box Culvert					
	Scour Mitigation					
Geotech						
	Geotech Report	0	$25,000.00	Lump	$0	
	Drilling	0	$25,000.00	Lump	$0	
Structures Subtotal					**$0**	Back to MAIN

Environmental and Landscaping - Improve Black Ridge Curve and Northern Interchanges Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Environmental & Landscaping						
Environmental						
	Wetland Mitigation	0	$50,000.00	Lump	$0	
	Noise Wall	0	$1,000.00	ft	$0	
Temporary Erosion Control						
	Silt Fence	0	$20.00	Ft	$0	
	Erosion Control Supervisor	0	$20,000.00	Lump	$0	
	Check Dams	0	$250.00	Each	$0	
Landscaping						
	Contractor Furnished Topsoil			sq ft		
	Strip, Stockpile, Spread Topsoil			sq ft		
	Wood Fiber Mulch			acre		
	Broadcast Seed			acre		
	Drill Seed			acre		
Environmental Mitigation Subtotal					$0	Back to MAIN

Miscellaneous - Improve Black Ridge Curve and Northern Interchanges Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Utilities						
	Relocate Water Line	0	$500.00	Lump	$0	
	Relocate Gas Line	0	$50,000.00	Lump	$0	
	Relocate Power Line			Lump		
	Relocate Fiber Optic			Lump		
	Relocate Phone			Lump		
	S.U.E	0	$20,000.00	Lump	$0	Assume $1.00 per foot per utility
Utilities Subtotal					**$0**	
Right-of-way						
	Urban/Suburban Residential	0	$5.00	sq ft	$0	Wasatch Front/Cache Valley/Cedar City/ Saint George areas
	Urban/Suburban Commercial	0	$15.00	sq ft	$0	Wasatch Front/Cache Valley/Cedar City/ Saint George areas
	non-Urban/Suburban Residential	0	$5.00	sq ft	$0	
	non-Urban/Suburban Commercial	0	$15.00	sq ft	$0	
	non-Urban/Suburban Farm	0	$1.00	sq ft	$0	
Right-of-Way Subtotal					**$0**	
Incentives						
	HMA Properties	0	$2.00	ton	$0	Max $2.31per ton of HMA
	Smoothness	5%	$4,606,470.00	lump	$230,324	% of HMA cost
	OGSC Properties	0	$1.75	ton	$0	Max $1.83 per ton of OGSC
	Lane Rental Incentive	0	$10,000.00	Lump	$0	
	Early Completion	1	$150,000.00	Lump	$150,000	
Incentives Subtotal					**$380,324**	
						Back to MAIN

Roadway / Pavement Summary (Activity 54C, 58C)

Project Design Criteria, as developed in the I-15 Washington County Corridor Study, is located at the end of the appendix. The following is a summary of the deficiencies located on the project.

Horizontal Alignment

The minimum horizontal curve radius for an 80 mph design speed is 3050 ft. I-15 was originally designed with a 65 mph design speed. With the increase in the speed limit several horizontal curves have become deficient. A summary of the deficient horizontal alignments and superelevations can be seen in the table below.

Deficient Horizontal Alignment

Direction	MP	Existing Radius (feet)	Existing Superelevation (e)	Notes
NB & SB	34.75	2864.90	4.9	65 mph design speed
NB & SB	37.45	2292.00	5.5	65 mph design speed

The horizontal alignment curve at MP 34.75 is not being addressed in this project. This curve is being addressed in the Safety Improvements project as identified in the I-15 Washington County Corridor Study. This project will bring the curve at MP 37.45 to an 80 mph design speed, due to the accident cluster located on the curve.

Vertical Alignment

Vertical Alignment deficiencies are based on sag or crest K-values. The minimum sag K-value is 231 for an 80 mph design speed and the minimum crest K-value is 384 for an 80 mph design speed. Using the as-built drawings for I-15, the vertical alignment deficiencies were determined and are summarized in the table below.

Deficient Vertical Alignment

Direction	MP	K	Notes	Type
SB	34.43	86.4	45 mph design speed	SAG
NB	34.43	86.43	45 mph design speed	SAG
SB	36.06	203.8	65 mph design speed	CREST
NB	36.06	203.83	65 mph design speed	CREST
SB	37.34	228.0	65 mph design speed	CREST
NB	37.35	228.02	65 mph design speed	CREST
SB	37.59	135.0	55 mph design speed	SAG
NB	37.59	134.95	55 mph design speed	SAG
SB	38.05	258.4	65 mph design speed	CREST
NB	38.05	265.96	65 mph design speed	CREST
SB	39.05	247.5	65 mph design speed	CREST
NB	39.05	247.52	65 mph design speed	CREST
SB	40.25	156.3	60 mph design speed	SAG

NB	40.25	156.25	60 mph design speed	SAG
SB	40.35	142.9	55 mph design speed	CREST
NB	40.35	142.86	55 mph design speed	CREST
SB	41.18	60.0	40 mph design speed	CREST
NB	41.18	60.01	40 mph design speed	CREST
SB	42.07	259.7	65 mph design speed	CREST
NB	42.07	259.74	65 mph design speed	CREST

Since none of the deficient vertical alignments were associated with an accident cluster, none of the deficient Vertical Alignments were recommended to be realigned. As a general note, if a horizontal or vertical alignment was deficient and no accident cluster was associated with the curve, then the deficiency was either signed or not realigned. This was done due to the high cost of realigning the alignment.

Stopping Sight Distance

The design stopping sight distance for the project is 910 ft for an 80 mph design speed. The table below summarizes the locations with deficient sight distance.

Deficient Stopping Sight Distance

Direction	From	To	Notes
SB	34.8	35	SB vegetation blocking view
SB	37.3	37.5	SB vegetation blocking view

The deficient stopping sight distance was not addressed in this project. These deficiencies were addressed in the Safety Improvements project as identified in the I-15 Washington County Corridor Study.

Ramp Deficiencies

The tables below summarize the deficient ramp acceleration/deceleration lengths and the ramp terminal/entrances deficiencies.

Deficient Ramp Acceleration/Deceleration Lengths

Direction	MP	Existing Length	Type	Notes
NB Decel	36.70	133.0	Tapered	Deficient deceleration
NB Accl	36.82	280.0	Tapered	Deficient acceleration
SB Accl	36.70	313.0	Tapered	Deficient acceleration
SB Decel	36.82	60.0	Tapered	Deficient deceleration
NB Decel	40.10	210.0	Tapered	Deficient deceleration
NB Accl	40.40	250.0	Tapered	Deficient acceleration
SB Accl	40.10	510.0	Tapered	Deficient acceleration
SB Decel	40.40	133.0	Tapered	Deficient deceleration
SB Accl	42.00	358.0	Tapered	Deficient acceleration
SB Decel	42.30	186.0	Tapered	Deficient deceleration

Deficient Ramp Terminals/Entrance

Direction	MP	Type	Notes
NB Decel	36.64	Tapered	Deficient terminal 8.5 degrees
SB Accl	36.675	Tapered	Deficient entrance 30:1 taper
SB Decel	36.838	Tapered	Deficient terminal 13.0 degrees
SB Decel	40.48	Tapered	Deficient terminal 7.8 degrees

All ramp deficiencies will be brought to standard on this project.

Pavement Design

The pavement design will need to be provided by the region pavement engineer. A preliminary pavement section has been provided for cost estimate purposes. To realign the deficient curve and make ramp improvements will require new pavement. The following pavement section was used in the cost estimate:

- 12 inch GB
- 8.5 inch UTBC
- 9.5 inch HMA
- 1.5 inch SMA

Traffic and Safety Summary (Activity 64C)

An Operational safety report will need to be completed by UDOT traffic and safety.

The I-15Washington County Corridor Study evaluated the corridor safety by identifying locations with a project based high number of severe accidents (accidents level 3 or higher). By geographically analyzing the accident data from 2002 to 2005, accident clusters were identified by determining grouping location of severe accidents. Some of the accident clusters were also verified by comments from UDOT maintenance and public comment.

Accident Clusters

MP	Description
37.45	Deficient horizontal curve, super does not meet speed. Poor horizontal and vertical sight distance. Icy road on curve do to cold winds coming down from canyon.

To address the accident clusters at MP 37.5, the deficient horizontal curve will be realigned and the cable barrier will be replaced with concrete barrier. This should prevent the high number of runoff crashes at this deficient curve.

Structures Summary (Activity 62C)

No structural work will be done on this project.

Environmental Summary (Activity 52C)

A categorical exclusion is the expected level of environmental documentation of the project.

Cultural and Paleontological

A significant number of cultural sites can be expected in this area. A few archeological studies have been performed on the parts of the project area. There is one ineligible documented cultural site from those surveys of the project. No impact to this site is expected. A cultural inventory within the project area will be needed to determine the extent of cultural sites in the area. No major impacts to these sites are expected.

Wetlands

No wetlands impacts are anticipated. Proper erosion control including rip rap, vegetation, and other techniques should be used throughout the project.

Threatened and Endangered Species

Utah Prairie Dog - Areas of possible high value habitat exist along the northern portion of the corridor (MP 40-42). No critical habitat has been designated for this species. Currently there are no known populations in Washington County. A survey may be required to determine if colonies are in the project limits and what impacts the project could have on them.

Bald Eagle - Wintering habitat only. No known winter roost sites or nest sites within 0.5-mile of I-15 corridor.

California Condor - Possible fly over. Possible habitat locations are the cliffs of Black Ridge, Kolob Terrace, and Zion National Park. Condors have not been seen in this area; they are found southeast of St. George in the Vermillion Cliffs. It is possible that future pairs could nest in the cliffs found along the northern section of I-15 in Washington County.

Mexican Spotted Owl - Habitat found in the cliffs at northern end of I-15 corridor in Zion National Park Kolob District. Federally designated critical habitat is within 0.5 mile east of the corridor (MP- 30-42). 2 years of survey with 4 surveys each year are required for spotted owls if suitable habitat is within 0.5 air miles of the construction area. A detail survey will only be required if suitable habitat is found in the initial survey. Survey season March 1 – August 31. Breeding season for the owls is March 15 – August 31.

Wildlife

Critical deer winter range exists throughout the project. The wildlife connectivity issues in this area are rated as “critical” for connectivity linkage zone #4-11 (se UDOT publication “Wildlife Connectivity across Utah’s Highways” June 2006) for deer, raptors, and cougar. An adequate number of crossings already exist if they are maintained to serve as crossings. The project is currently fenced with livestock fencing in poor condition. This fence needs to be replaced with the current standard wildlife fence.

This project does not address wildlife issues, but deer fence is recommended in a phase III project.

Right of Way Summary (Activity 56C)

There is potential impact to the right-of-way from realigning the deficient horizontal curve, although it is felt that a design can be developed that would avoid any right-of-way takes. Preliminary engineering will be needed to determine if there will be an impact and the extent of that impact. No cost was added to the project total for right-of-way purchases.

Utility and Railroad Summary (Activity 68C)

No utility or railroad conflicts identified.

ITS Summary (Activity 66C)

No ITS implementation on this project. However, if the option to realign the curve at Black Ridge is not selected, but signing the curve is selected instead, an ITS system would be recommended (for more information see the I-15 Washington County Corridor Study). The ITS work will involve constructing a Road Weather Information System (RWIS) with variable message signs (VMS). This will create a system that can warn traffic of poor weather conditions to aide drivers in negotiating the curve. The cost estimate for the RWIS and VMS has been attached at the end of this concept report.

Public Involvement Summary (Activity 60C)

The public involvement plan is to coordinate with local municipalities, Port of Entry, Truckers Association, Tourism Bureau, and local media, on project construction schedule and traffic impacts.

PROJECT DESIGN CRITERIA

I. PROJECT DESCRIPTION

Date: January 17, 2008

Project Name	**I-15 Corridor Study, Washington County MP 0 to 42**		
Project Number	**S-R499(48)**	PIN	**6361**

Describe the scope of the project: A corridor study for I-15 from the Arizona State Line (MP 0) in Washington County to the New Harmony Interchange (MP 42) in Washington County. The purpose of the project is to identify corridor needs and constraints, provide solutions, prioritize and develop a schedule for implementing those solutions, and provide concept reports for immediate projects. Projects identified will be included on the STIP. The time period for the corridor study includes analysis for the current year 2007 and the next 30 years (2040).

II. DESIGN STANDARDS BY ROADWAY (complete for each roadway on your project)

ROADWAY: I-15, MP 0.0 to MP 11.5

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**70 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	70 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft								
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504-505 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	2040 ft			Mainline					

I-15, MP 0.0 to MP 11.5 (continued)

12 Critical Elements	UDOT Standard			Proposed			Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value		Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Mainline	181	247	Mainline				
Profile Grades	% Min		% Max	% Min		% Max		AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5					
Stopping-Sight Distance	Minimum			Minimum				AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	730 ft		Mainline				
Cross Slope	Minimum							AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%							
Superelevation	Maximum Superelevation (UDOT Standard)							UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%							
Structural Capacity	Design Loading							Reference roadway design MOI, pg 288
	HS20 existing bridges HL-93 new structures							
Vertical Clearance*	Minimum							UDOT Roadway Design MOI p. 64
	16 feet 6 inches							
Bridge Width	Minimum							UDOT Roadway Design MOI p. 63
	Add 2 ft to travel way to each side of bridge							

I-15, MP 0.0 to MP 11.5 (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: I-15, MP 11.5 to MP 42

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**80 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	80 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft				.				
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	3050 ft			Mainline					
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value			AASHTO GB p. 272 & 277
	Mainline	231	384		Mainline					
Profile Grades	% Min		% Max		% Min		% Max			AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5							
Stopping-Sight Distance	Minimum				Minimum					AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	910 ft			Mainline					
Cross Slope	Minimum									AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%									
Superelevation	Maximum Superelevation (UDOT Standard)									UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%									

I-15, MP 11.5 to MP 42

12 Critical Elements	UDOT Standard	Proposed	Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Structural Capacity	Design Loading HS20 existing bridges HL-93 new structures			Reference roadway design MOI, pg 288
Vertical Clearance*	Minimum 16 feet 6 inches			UDOT Roadway Design MOI p. 64
Bridge Width	Minimum Add 2 ft to travel way to each side of bridge			UDOT Roadway Design MOI p. 63

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft (not in roadside table)			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General Off Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General Off Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	40 mph or less 14 ft to 16 ft 50 mph 18 ft to 20 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1 sideslope
Ramp Terminal Sight Distance	25 mph – 155 ft			AASHTO GB p. 828
Ramp Design	UDOT STD DWG DD 6			AASHTO GB p. 825+
Gores	UDOT STD DWG DD 6			AASHTO GB p. 832-837
Ramp Terminals	UDOT STD DWG DD 6			AASHTO GB p. 840-845
Ramp Entrances	UDOT STD DWG DD 6			AASHTO GB p. 845
Acceleration Lanes	AASHTO p. 847, 848			
Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General Off Ramp (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Guardrail Bridge Connection	N/A			
Sideslopes	6:1 in clear zone			UDOT STD DWG DD 4 AASHTO GB p. 326-329
Intersection Sight Distance	UDOT Roadway Design MOI p. 127-128 AASHTO GB p. 650-677			
Shoulder/Travel way (gutter pan)	Gutter pan not included in travelway or shoulder			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General On Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	**See attached**	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General On Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	40 mph or less 14 ft to 16 ft 50 mph 18 ft to 20 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1 sideslope
Ramp Terminal Sight Distance	25 mph – 155 ft			AASHTO GB p. 828
Ramp Design	UDOT STD DWG DD 6			AASHTO GB p. 825+
Gores	UDOT STD DWG DD 6			AASHTO GB p. 832-837
Ramp Terminals	UDOT STD DWG DD 6			AASHTO GB p. 840-845
Ramp Entrances	UDOT STD DWG DD 6			AASHTO GB p. 845
Acceleration Lanes	AASHTO p. 847, 848			
Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General On Ramp (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Guardrail Bridge Connection	N/A			
Sideslopes	6:1 in clear zone			UDOT STD DWG DD 4 AASHTO GB p. 326-329
Intersection Sight Distance	UDOT Roadway Design MOI p. 127-128 AASHTO GB p. 650-677			
Shoulder/Travel way (gutter pan)	Gutter pan not included in travelway or shoulder			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

Prepared by:_____ Phone Number:_____

Verified Only - Region Preconstruction Engineer:_____ Date:_____

Approved by Region Preconstruction Engineer, Consulting Engineer,
or Local Government Engineer:_____ Date:_____

Required Signatures

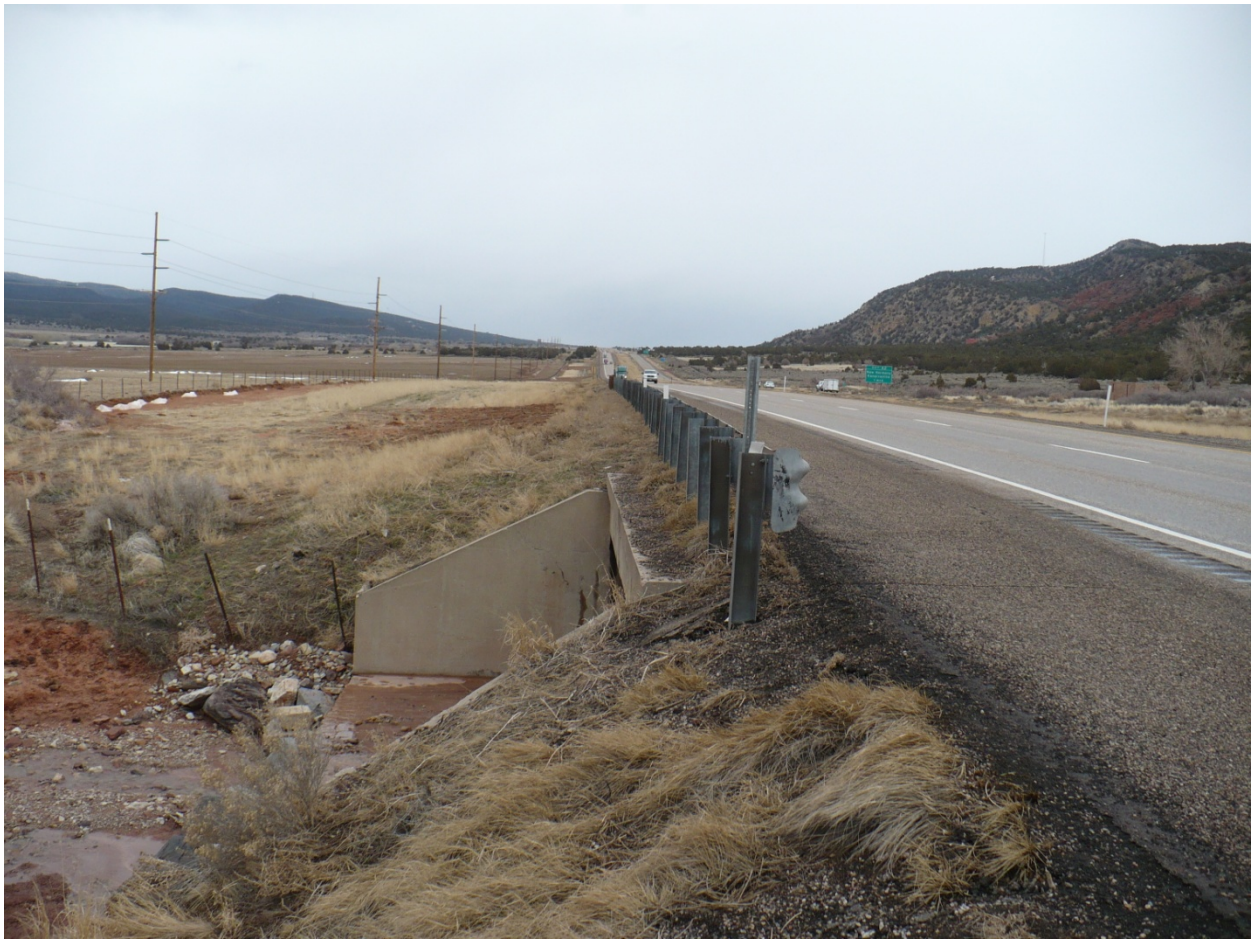
Local government projects require Regional Preconstruction Engineer signature for verification and the Local Government Engineer signature for approval.
Local government projects on State highway system require the Region Preconstruction Engineer signature for approval.
All other projects require Region Preconstruction Engineer signature for approval.

UTAH DEPARTMENT OF TRANSPORTATION
Region 4

CONCEPT REPORT
For

Pavement Rehabilitation (MP 34 to 42)

October 28, 2008



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Public Involvement Summary (Activity 60C)

CONCEPT REPORT SUMMARY

SECTION 1: General Information

Project Name:	**Pavement Rehabilitation (MP 34 to 42)**		
Project Manager:	**Kim Manwill**	**County:**	**Washington**
Pin Number:		**Begin Mile Post:**	**34.3**
Project Number:		**End Mile Post:**	**42.2**
Route Number:	**15**	**Design Year:**	**2011**
Functional Classification:	**Interstate**	**Design Speed:**	**80 mph**

Describe the Purpose/Need for this Project:

The purpose of the Pavement Rehabilitation MP 34 to 42 is to maintain the existing pavement, structures, and roadway to a satisfactory level. Due to the deterioration of the existing pavement major and minor rehabilitation will be needed to bring the existing pavement to a sufficient level.

Major Project Risks:

- Oil Cost Escalation- Pavement costs make up the bulk of this projects budget. To mitigate the cost of pavement, a standard 10% contingency has used.
- Deficient Horizontal and Vertical Curves – By not realigning all horizontal and vertical curves to standard presents a safety risk. These can be mitigated by realigning the deficient curve with known safety problems and signing other deficient curves (that were deemed necessary) with speed advisory or other appropriate warning signs.

Project Estimate and Timeline:

Planning Estimate:		**Proposed Construction FY:**	**2011**
Total Project Cost (Current Year):	**$20,559,000**	**Estimated Construction Duration:**	*1 year*
Construction Year Estimate (2011):	**$25,089,000**	**Recommended Commission Approved Amount:**	

Signature Block:

Project Manager **Date**	**Region Preconstruction Engineer** **Date**
Region STIP Workshop Chair **Date**	**Region Director** **Date**
Consultant **Date**	

SECTION 2: Design Information (Executive Summary)

Roadway / Pavement Summary (Activities 54C, 58C)	**Estimated Construction Cost:**	**$15,247,000**

Of the deficiencies identified on this project superelevation, vertical clearance, clear zone, and guardrail will be fixed with this project. Horizontal alignment, ramp deficiencies, and stopping site distance will be fixed by the other projects in the area, Improve Black Ridge Curve and Northern Interchanges and Climbing Lane (MP 34 to 37) as identified in the I-15 Washington County Corridor Study. The vertical alignments will not be brought to standard, because no accident cluster was associated with any of the deficiencies.

Design exceptions will be needed for the vertical and horizontal alignments.

Maintenance has expressed concerns for the capacity of the Dry Creek culvert. The flows are known to sometimes exceed the culvert capacity. The culvert is planned to be replaced with this project. Also cross drainage and ponding problems were identified on the Northern part of the project, MP 38-42. These drainage problems will not be addressed in this project, but will be addressed in a project in phase III as identified in the I-15 Washington County Corridor Study.

The pavement will require major/minor rehabilitation, to bring the pavement to a satisfactory level. The pavement will consist of 2” spot rotomilling, 3” in-place cold recycled asphaltic base, 1.5” hot mix asphalt, and 1.5” stone matrix asphalt.

Traffic and Safety Summary (Activity 64C)	**Estimated Construction Cost:**	**$835,000**

The expected traffic and safety work for the project is to consist of bringing guardrail and crash cushions up to standard on the project. Also all signs need to be replaced and if necessary brought to current standard.

Structures Summary (Activity 62C)	**Estimated Construction Cost:**	**$1,164,000**

The Ash Creek Reservoir Spillway and Dry Creek Box Culvert structures need to be widened or replaced to accommodate flows. The plan for the other structures, Black Ridge, Kolob Canyon, and New Harmony Interchanges, is to perform preventative maintenance such as:

- Asphalt surfacing removal (structures)
- Pothole patching (deck only)
- Waterproofing membrane (deck and approach slabs)
- 2" hot mix asphalt overlay
- 1" open graded surface course
- Seal parapets
- Joint replacement.

The Ash Creek Reservoir widening will need to coordinate the design of the following projects, Improve Black Ridge Curve and Northern Interchanges, Pavement Rehabilitation (MP 34 to 42), and Climbing Lane (MP 34 to 37) projects as identified in the I-15 Washington County Corridor Study.

Environmental Summary (Activity 52C)	**Estimated Mitigation Cost:**	**$18,000**

A categorical exclusion is the expected level of environmental documentation of the project.

A significant number of cultural sites can be expected in this area. A cultural inventory within the project area will be needed to determine the extent of cultural sites in the area.

Several sensitive species have been identified as having potential habitat within 0.5 mile of the corridor. These are Utah Prairie Dog, Bald Eagle, and California Condor. Survey will be required to determine if these species have habitat near the corridor. Mitigation would include limited construction during nesting season and silt fencing for the Utah Prairie Dogs.

The Mexican Spotted Owl has designated critical habitat within 0.5 mile of the corridor. The Mexican Spotted Owl will require survey to be preformed 2 years prior to construction. The Mitigation plan would be to discourage the owls from nesting or to avoid construction during the nesting season March through August.

The environmental documentation cost has been included in the PE cost in the cost estimate. The environmental mitigation cost includes silt fence, erosion control, and check dams.

Right of Way Summary (Activity 56C)	**Estimated Property Cost:**	**$0**

No Right-of-Way impacts or acquisition expected.

CONCEPT REPORT SUMMARY

Utility and Railroad Summary (Activity 68C)	**Estimated Relocation Cost:**	**$0**
No utility or railroad conflicts expected.		

ITS Summary (Activity 66C)	**Estimated Construction Cost:**	**$0**
No ITS improvements are to be completed with this project. Consideration should be given to adding a VMS and RWIS system to warn truck and other traffic of poor weather conditions on the Black Ridge. No ITS cost was accounted for in this project.		

Public Involvement Summary (Activity 60C)	**Estimated Cost:**	**$15,000**
The public involvement plan is to coordinate with local municipalities, Port of Entry, Truckers Association, Tourism Bureau, and local media, on project construction schedule and traffic impacts.		

Miscellaneous Summary:

This project is to be designed in coordination of the other projects in the area as identified in the I-15 Washington County Corridor Study. The three projects to be considered are, Improve Black Ridge Curve and Northern Interchanges, Pavement Rehabilitation (MP 34 to 42), and Climbing Lane (MP 34 to 37). Consideration should be given to add as many additional pieces of the Improve Black Ridge Curve and Northern Interchanges and Climbing Lane (MP 34 to 37) projects to the Pavement Rehabilitation (MP 34 to 42) project. Those project elements include adding acceleration and deceleration lengths to Interchanges 36, 40, and 42, add a climbing lane MP 34 to 37, and realigning the deficient curve at MP 37.5.

The total construction cost includes concept report cost, PE, CE, and a 10% project contingency. See the Concept Estimate following this summary.

CONCEPT REPORT
Appendix A

SECTION 3: Project Log

Complete the Following:

Date Received	Deliverable
	Roadway/Pavement Summary (Activities 54C, 58C)
	Traffic and Safety Summary (Activity 64C)
	Structures Summary (Activity 62C)
	Environmental Summary (Activity 52C)
	Right of Way Summary (Activity 56C)
	Utility and Railroad Summary (Activity 68C)
	ITS Summary (Activity 66C)
	Public Involvement Summary (Activity 60C)

(Update this as major decisions are made regarding the project.)

Date	Decision Made
10/08	Preliminary Concept Report from I-15 Washington County Corridor Study

PIN ----- PROJECT # ----- Pavement Rehabilitation (MP 34 to 42)

Cost Estimate - Concept Level

Approximate Route Reference Post (BEGIN) =	34.324	(END) =	42.198	
Accumulated Mileage (BEGIN) =	34.324	(END) =	42.199	
Project Length =	7.875	miles	41,579 ft	
Current Year =	2008			
Assumed Construction Year =	2011			
Assumed Yearly Inflation for Construction and Utility Items (%/yr) =	7.0%	3 yrs for inflation		For projects 1 Year out use 10%, 2 Years 9%,
Assumed Yearly Inflation for Engineering Services (PE and CE) (%/yr) =	6.0%			
Assumed Yearly Inflation for Urban Residential Right of Way (%/yr) =	6.5%			
Assumed Yearly Inflation for Urban Commercial Right of Way (%/yr) =	4.0%			
Assumed Yearly Inflation for non-Urban Right of Way (%/yr) =	2.0%			
Construction Items Contingency (% of Construction) =	10.0%			10% Rural PB; 15% Urban PB; 20% Non PB
Preliminary Engineering (% of Construction + Incentives) =	8.0%			
Construction Engineering (% of Construction + Incentives) =	10.0%			

Item #					Cost	Remarks
Construction						
	Roadway and Drainage				$12,445,793	
	Traffic and Safety				$681,965	
	Structures				$950,000	
	Environmental Mitigation				$31,000	
	ITS				$0	
				Subtotal	$14,108,758	
			Construction Items Contingency (for minor items not listed)	(10%)	$1,410,876	
				Construction Subtotal	**$15,519,634**	
P.E. Cost				**P.E. Subtotal**	**$1,242,000**	8%
C.E. Cost				**C.E. Subtotal**	**$1,586,000**	10%
Right of Way Urban/Suburban Residential				**Right of Way Subtotal**	$0	
Right of Way Urban Suburban Commercial				**Right of Way Subtotal**	$0	
Right of Way non-Urban/Suburban				**Right of Way Subtotal**	$0	
Utilities				**Utilities Subtotal**	$0	
Incentives				**Incentives Subtotal**	$339,096	
Miscellaneous				**Miscellaneous Subtotal**	**$0**	

Cost Estimate (ePM screen 505)		2008		2011	
Concept Report Cost	0.2%	**$31,000.00**		**$31,000.00**	includes cost for environmental surveys
P.E.		**$1,242,000**		**$1,479,242**	
Right of Way		**$0**		**$0**	
Utilities		**$0**		**$0**	
Construction		**$15,519,634**		**$19,012,219**	
C.E.		**$1,586,000**		**$1,888,951**	
Incentives		**$339,096**		**$415,407**	
Contingency	**10%**	**$1,871,773**		**$2,293,002**	
Miscellaneous		**$0**		**$0**	
	TOTAL	**$20,558,502**	**TOTAL**	**$25,088,821**	

PROPOSED COMMISSION REQUEST	**TOTAL**	**$20,559,000**	**TOTAL**	**$25,089,000**

Cost Estimate Summary of Assumptions - Pavement Rehabilitation (MP 34 to 42)

Unit Weights			Application Rates	
Borrow	133	lb/cf		
Gran. Backfill Borrow	133	lb/cf		
Granular Borrow	133	lb/cf		
UTBC	136	lb/cf		
HMA	152	lb/cf		
SMA	149	lb/cf		
Asphalt Cement	6.20%	OGSC		
Prime Coat	250	gal/ton	0.5	gal/sy
Tack Coat	240	gal/ton	0.08	gal/sy
Emulsified Asphalt LMCRS-2	250	gal/ton	0.4	gal/sy
Flush Coat	245	gal/ton	0.11	gal/sy
Water			42	gal/cy GB
			51	gal/cy UTBC
			45	gal/cy Borrow/Embank

Choose Either Ton or Vol
Manually Input

Water			
Material	Vol cy	gal	1,000 gal
GB	1531	64302	64.3
UTBC	962	49062	49.1
Borrow	6519	293355	293.4
Embankment	8000	360000	360.0
TOTAL			767

Oil								
Roadway	Prime Coat		Tack Coat			LMCRS-2		Flush Coat	
	Area sy	Tons	# of apps	Area sy	Tons	Area sy	Tons	Area sy	Tons
NB (Sub-base Failure)	4072	8.1	0	3618	0.0				
			0						
			0						
			0	176985	0.0				
			0	176985	0.0				
TOTALS		9			0		0		0

Pavements

Roadway	Length	Top Width	Side Slope	GB				UTBC				HMA			SMA		Asphalt Cement	Chip Seal	4" LCBC		CIPR		Mill - ___"	
				Depth	Width	Vol	Tons	Depth	Width	Vol	Tons	Depth	Width	Tons	Depth	Tons			Width	Area	Depth	Area	Depth	Area
Full Depth Work ***(1 Side)****:*	ft	ft		in	ft	cy		in	ft	cy		in	ft		in		Tons	sy	ft	sy	in	sy	in	sy
NB (Sub-base Failure)	800	38	1/6	12	46.2	1530	2747	8.5	45.8	962	1765	9.5	40.7	1959	1.5	283								
Mill/Overlay Work:																								
NB	41575	38	1									1.5	38.3	15132	1.5	14712					3	175538		
SB	41575	38	1									1.5	38.3	15132	1.5	14712					3	175538		
Ranch Exit 36 Ramps	2480	24	1									1.5	24.3	573	1.5	554							2	6613
Kolob Canyon Ramps	4450	24	1									1.5	24.3	1028	1.5	995							2	11867
New Harmony Ramps	2410	24	1									1.5	24.3	557	1.5	539							2	6427
TOTALS						1531	49202			962	1766			34381		31796	0	0		0		351076		24907

Earthwork

Roadway	Roadway Excavation				Borrow					Granular Backfill Borrow				
	Length	Depth	Width	Vol	Length	Depth	Width	Vol	Tons	Length	Depth	Width	Vol	Tons
	ft	in	ft	cy	ft	in	ft	cy		ft	in	ft	cy	
NB (Sub-base Failure)	1600	32	38	6005				0	0				0	0
								0	0				0	0
								0	0				0	0
								0	0				0	0
NB					5280	20	10	3259	5852					
SB					5280	20	10	3259	5852					
TOTALS				6005				6519	11704				0	0

Cross Section	inside shldr	lane width	outside shldr	total
NB& SB	4	24	10	38
NB (Sub-base Failure)	4	24	10	38
Ramps	4	14	6	24

Fill **Assumptions**
width 10 ft additional to bring to current standard of 30 ft clear zone at 6:1
depth 20 inch average

Roadway and Drainage - Pavement Rehabilitation (MP 34 to 42)

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Item #	Item	Quantity	Price	Units	Cost	Remarks
Roadway and Drainage						
012850010	Mobilization	1	$1,500,000.00	Lump	$1,500,000	10% of construction
013150010	Public Information Services	1	$15,000.00	Lump	$15,000	
015540005	Traffic Control	1	$750,000.00	Lump	$750,000	5% of construction
01557001*	Maintenance of Traffic	0	$0.00	Lump	$0	
015720010	Dust Control & Watering	767	$25.00	1000 gal	$19,175	
017210020	Survey	1	$160,000.00	Lump	$160,000	1% of construction
020560005	Borrow (Plan Quantity)	6519	$15.00	Cu yd	$97,785	
020560010	Borrow	0	$8.00	Ton	$0	
020560015	Granular Borrow (Plan Quantity)	1531	$17.00	Cu yd	$26,027	
020560025	Granular Backfill Borrow (Plan Quantity)	0	$35.19	Cu yd	$0	
020560030	Granular Backfill Borrow	0	$10.00	Ton	$0	
022210015	Remove Bridge	0	$22,594.54	each	$0	
002210080	Remove Fence	0	$1.08	ft	$0	
022210095	Remove Pipe Culvert	0	$20.00	ft	$0	
023160020	Roadway Excavation (Plan Quantity)	6005	$12.00	Cu yd	$72,060	
023310020	Clearing and Grubbing	0	$2,400.00	Acre	$0	
023730010	Loose Riprap	0	$90.00	Cu yd	$0	
027210070	Untreated Base Course 3/4 inch or 1 inch Max	1766	$23.50	Ton	$41,501	
027410060	HMA - 3/4 Inch	34381	$110.00	Ton	$3,781,910	
027480010	Liquid Asphalt MC-70 or MC-250	9	$1,000.00	Ton	$9,000	
027480030	Emulsified Asphalt SS-1	0	$250.00	Ton	$0	
027520020	Portland Cement Concrete Pavement 9 inch Thick	0	$27.82	Sq yd	$0	
027710025	Concrete Curb and Gutter Type B1	0	$14.00	ft	$0	
027760010	Concrete Sidewalk	0	$20.00	Sq yd	$0	
027850030	Chip Seal Coat, Type C	0	$1.00	Sq yd	$0	
027850060	Emulsified Asphalt LMCRS-2	0	$350.00	Ton	$0	
02785008*	Flush Coat	0	$250.00	Ton	$0	
02744000*	SMA - 1/2 inch	31796	$120.00	Ton	$3,815,520	
027860020	Asphalt Cement PG 64-34	0	$200.00	Ton	$0	
028220010	Right of Way Fence, Type G (Deer Fence)	0	$4.00	ft	$0	
029120050	Strip, Stockpile, and Spread Topsoil	277200	$1.00	Sq yd	$277,200	Assumed LxW
029220010	Drill Seed	56	$470.00	Acre	$26,320	Assumed LxW
029610050	Rotomilling	24907	$4.50	Sq yd	$112,080	
026100032	24 Inch Pipe Culvert, Class C	0	$24.79	ft	$0	
026100034	24 Inch Pipe Culvert, Class C	0	$36.14	ft	$0	
026100038	36 Inch Pipe Culvert, Class C	0	$65.72	ft	$0	
026100042	48 Inch Pipe Culvert, Class C	0	$98.02	ft	$0	
	Concrete Headwall	0	$5,000.00	each	$0	
029620010	In-Place Cold Recycled Asphaltic Base	351076	$2.60	Sq yd	$912,798	
	Solventless Emulsion	1382	$600.00	Ton	$829,417	
Roadway and Drainage Subtotal					**$12,445,793**	Back to Main

Traffic, Safety & ITS - Pavement Rehabilitation (MP 34 to 42)

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	Item	Quantity	Price	Units	Cost	Remarks
Traffic, Safety & ITS						
Traffic						
	W-Beam Guardrail	21120	$22.00	ft	$464,640	assumed length
	Crash Cushion Type G	28	$3,000.00	Each	$84,000	
	Concrete Barrier (New Jersey Shape)	0	$50.00	ft	$0	
	Pavement Marking Paint	1975	$27.00	gal	$53,325	
	Pavement Message Paint	0	$0.00	Each	$0	
	Signs	1	$80,000.00	Lump	$80,000	
Signals						
Lighting						
	Highway Lighting System	0	$150,000.00	Each	$0	
Traffic and Safety Subtotal					**$681,965**	
ITS						
	Multiduct Conduit	0	$50,000.00	Lump	$0	
ITS Subtotal					**$0**	Back to MAIN

Structures - Pavement Rehabilitation (MP 34 to 42)

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Item #	Item	Quantity	Price	Units	Cost	Remarks
Structures						
Bridges						
	Structure Maintenance	3	$100,000.00		$300,000	$100,000 assumed for each interchange
	Widen or Replace Ash Creek Culvert	1	$300,000.00		$300,000	
	Widen or Replace Dry Creek Culvert	1	$300,000.00		$300,000	
Walls						
	Retaining Wall	0	$50.00	Sq ft	$0	Assumed LxH (wall area)
				ft		
Hydraulics						
	Extend Box Culvert	0	$200.00	ft	$0	
	New Box Culvert					
	Scour Mitigation					
Geotech						
	Geotech Report	1	$25,000.00	Lump	$25,000	
	Drilling	1	$25,000.00	Lump	$25,000	
Structures Subtotal					**$950,000**	Back to MAIN

Environmental and Landscaping - Pavement Rehabilitation (MP 34 to 42)

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Item #	Item	Quantity	Price	Units	Cost	Remarks
Environmental & Landscaping						
Environmental						
	Environmental Mitigation	0	$50,000.00	Lump	$0	
	Noise Wall	0	$1,000.00	ft	$0	
Temporary Erosion Control						
	Silt Fence	400	$20.00	Ft	$8,000	
	Erosion Control Supervisor	1	$20,000.00	Lump	$20,000	
	Check Dams	12	$250.00	Each	$3,000	
Landscaping						
	Contractor Furnished Topsoil			sq ft		
	Strip, Stockpile, Spread Topsoil			sq ft		
	Wood Fiber Mulch			acre		
	Broadcast Seed			acre		
	Drill Seed			acre		
Environmental Mitigation Subtotal					$31,000	Back to MAIN

Miscellaneous - Pavement Rehabilitation (MP 34 to 42)

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Item #	Item	Quantity	Price	Units	Cost	Remarks
Utilities						
	Relocate Water Line	0	$500.00	Lump	$0	
	Relocate Gas Line	0	$50,000.00	Lump	$0	
	Relocate Power Line			Lump		
	Relocate Fiber Optic			Lump		
	Relocate Phone			Lump		
	S.U.E	0	$20,000.00	Lump	$0	Assume $1.00 per foot per utility
Utilities Subtotal					**$0**	
Right-of-way						
	Urban/Suburban Residential	0	$5.00	sq ft	$0	Wasatch Front/Cache Valley/Cedar City/ Saint George areas
	Urban/Suburban Commercial	0	$15.00	sq ft	$0	Wasatch Front/Cache Valley/Cedar City/ Saint George areas
	non-Urban/Suburban Residential	0	$5.00	sq ft	$0	
	non-Urban/Suburban Commercial	0	$15.00	sq ft	$0	
	non-Urban/Suburban Farm	0	$1.00	sq ft	$0	
Right-of-Way Subtotal					**$0**	
Incentives						
	HMA Properties	0	$2.00	ton	$0	Max $2.31per ton of HMA
	Smoothness	5%	$3,781,910.00	lump	$189,096	% of HMA cost
	OGSC Properties	0	$1.75	ton	$0	Max $1.83 per ton of OGSC
	Lane Rental Incentive	0	$10,000.00	Lump	$0	
	Early Completion	1	$150,000.00	Lump	$150,000	
Incentives Subtotal					**$339,096**	
						Back to MAIN

Roadway / Pavement Summary (Activities 54C, 58C)

Project Design Criteria, as developed in the I-15 Washington County Corridor Study, is located at the end of the appendix. The following is a summary of the deficiencies located on the project.

Horizontal Alignment

The minimum horizontal curve radius for an 80 mph design speed is 3050 ft. I-15 was originally designed with a 65 mph design speed. With the increase in the speed limit, several horizontal curves have become deficient. A summary of the deficient horizontal alignments and superelevations can be seen in the table below.

Deficient Horizontal Alignment

Direction	MP	Existing Radius (feet)	Existing Superelevation (e)	Notes
NB & SB	34.75	2864.90	4.9	65 mph design speed
NB & SB	38.00	2292.00	5.5	65 mph design speed

The Horizontal Alignments were not addressed in this project. These deficiencies were addressed in the Safety Improvements and Black Ridge Curve and Northern Interchange projects (see the I-15 Washington County Corridor Study). The curve at MP 34.75 is to have a warning sign placed and the curve at MP 38.00 is recommended to be realigned due to the accident cluster located on that curve.

Vertical Alignment

Vertical Alignment deficiencies are based on sag or crest K-values. The minimum sag K-value is 231 for an 80 mph design speed and the minimum crest K-value is 384 for an 80 mph design speed. Using the as-built drawings for I-15, the vertical alignment deficiencies were determined and are summarized in the table below.

Deficient Vertical Alignment

Direction	MP	K	Notes	Type
SB	34.43	86.4	45 mph design speed	SAG
NB	34.43	86.43	45 mph design speed	SAG
SB	36.06	203.8	65 mph design speed	CREST
NB	36.06	203.83	65 mph design speed	CREST
SB	37.34	228.0	65 mph design speed	CREST
NB	37.35	228.02	65 mph design speed	CREST
SB	37.59	135.0	55 mph design speed	SAG
NB	37.59	134.95	55 mph design speed	SAG
SB	38.05	258.4	65 mph design speed	CREST
NB	38.05	265.96	65 mph design speed	CREST
SB	39.05	247.5	65 mph design speed	CREST
NB	39.05	247.52	65 mph design speed	CREST
SB	40.25	156.3	60 mph design speed	SAG

NB	40.25	156.25	60 mph design speed	SAG
SB	40.35	142.9	55 mph design speed	CREST
NB	40.35	142.86	55 mph design speed	CREST
SB	41.18	60.0	40 mph design speed	CREST
NB	41.18	60.01	40 mph design speed	CREST
SB	42.07	259.7	65 mph design speed	CREST
NB	42.07	259.74	65 mph design speed	CREST

Since none of the deficient vertical alignments were associated with an accident cluster, none of the deficient Vertical Alignments were recommended to be realigned.

Superelevations

The superelevations for the project were originally design for 65 mph. The deficient superelevations will need to be brought to an 80 mph design speed.

Stopping Sight Distance

The design stopping sight distance for the project is 910 ft for an 80 mph design speed. The table below summarizes the locations with deficient sight distance.

Deficient Stopping Sight Distance

Direction	From	To	Notes
SB	34.8	35	SB vegetation blocking view
SB	37.3	37.5	SB vegetation blocking view

The deficient stopping sight distance was not addressed in this project. These deficiencies were addressed in the Safety Improvements project as described in the I-15 Washington County Corridor Study.

Vertical Clearance

The structures at the Kolob Canyon and New Harmony Interchanges currently meet AASHTO standards. Caution needs to be exercised with the pavement overlay to not make these structures less than 16’-0”. This may include rotomilling or realigning the grade to make the clearance acceptable.

Vertical Clearance

ID	Year	Direction	MP	Clearance	Feature Crossed	Notes
1D 633	1959	NB	40.274	16.2	I-15 Over Park Road - Int. X-Road	Caution
3D 633	1959	SB	40.274	16.2	I-15 Over Park Road - Int. X-Road	Caution
1D 632	1959	NB	42.176	16.4	I-15 Over New Harmony Rd, Int. X-Rd	Caution
3D 632	1959	SB	42.176	16.4	I-15 Over New Harmony Rd, Int. X-Rd	Caution

Clear Zone

The minimum clear zone for the project is 30 to 34 ft. Locations denoted in the tables below are deficient due to steep sideslopes or obstacles in the clear zone.

Deficient Clear Zone

Direction	From MP	To MP	Notes
Median	34.50	35.40	Steep sideslopes
SB	35.60	36.50	Steep sideslopes
Median	35.60	36.50	Trees located in clear zone
NB	36.90	37.10	Steep sideslopes
SB	36.86	37.14	Steep sideslopes
SB	41.60	41.90	Trees located in clear zone

Culverts in Clear zone

Direction	MP	Notes
SB	35.520	Culvert in clear zone
NB	36.506	Culvert in clear zone
NB & SB	38.723	Culvert in clear zone
NB & SB	39.040	Culvert in clear zone
NB & SB	39.210	Culvert in clear zone
NB & SB	39.688	Culvert in clear zone
NB & SB	39.987	Culvert in clear zone
NB & SB	40.840	Culvert in clear zone
NB & SB	41.198	Culvert in clear zone
NB & SB	41.260	Culvert in clear zone
NB & SB	41.438	Culvert in clear zone
NB & SB	41.510	Culvert in clear zone
NB & SB	41.800	Culvert in clear zone
NB & SB	42.184	Culvert in clear zone

This project will fix all clearzone issues by eliminating the obstacle, correcting the side slope, or protecting the obstacle.

Guardrail

Deficient guardrail was defined as guardrail that did not meet the height standard of 32 inches, guardrail with Texas turndown end sections, and guardrail/barrier with insufficient length of need. As a general note, no barrier offset was found at any guardrail or barrier location on the project. A summary of the deficient guardrail and length of need is located in the tables below.

Deficient Guardrail

Direction	MP	Notes
SB	36.25	short guardrail
SB	37.80	short guardrail

Insufficient length of need

Direction	MP	Notes
NB	34.80	Insufficient length of need
SB	35.40	Insufficient length of need
SB	38.41	Insufficient length of need

All guardrail on the project will be brought to standard.

Ramp Deficiencies

The tables below summarize the deficient ramp acceleration/deceleration lengths and the ramp terminal/entrances deficiencies.

Deficient Ramp Acceleration/Deceleration Lengths

Direction	MP	Existing Length	Type	Notes
NB Decel	36.70	133.0	Tapered	Deficient deceleration
NB Accel	36.82	280.0	Tapered	Deficient acceleration
SB Accel	36.70	313.0	Tapered	Deficient acceleration
SB Decel	36.82	60.0	Tapered	Deficient deceleration
NB Decel	40.10	210.0	Tapered	Deficient deceleration
NB Accel	40.40	250.0	Tapered	Deficient acceleration
SB Accel	40.10	510.0	Tapered	Deficient acceleration
SB Decel	40.40	133.0	Tapered	Deficient deceleration
SB Accel	42.00	358.0	Tapered	Deficient acceleration
SB Decel	42.30	186.0	Tapered	Deficient deceleration

Deficient Ramp Terminals/Entrance

Direction	MP	Type	Notes
NB Decel	36.64	Tapered	Deficient terminal 8.5 degrees
SB Accel	36.675	Tapered	Deficient entrance 30:1 taper
SB Decel	36.838	Tapered	Deficient terminal 13.0 degrees
SB Decel	40.48	Tapered	Deficient terminal 7.8 degrees

The Ramp deficiencies were not addressed in this project. These deficiencies were addressed in the Black Ridge Curve projects and Northern Interchanges project as described in the I-15 Washington County Corridor Study.

Drainage

The major drainage issues for the project are cross drainage, ponding, and insufficient capacity on the Dry Creek culvert. According to the maintenance supervisor the dry creek culvert fills with debris every 5 to 10 years and water from the drainage overflows onto I-15. Ponding is another drainage problem in this same area. Ponding occurs around most of the culverts from MP 37 to 42. This is due to no defined

cross drainage system beyond UDOT right-of-way. This also causes many of the culverts to fill with silt which causes further ponding along this segment of I-15.

The drainage concerns are not being addressed by this project, but will be addressed by a project in phase III as described in the I-15 Washington County Corridor Study. No drainage costs were added into the project total. The conditions of each pipe will need to be assessed at a later date, to determine if they need to be replaced.

The deficient Dry Creek culvert is planned to be replaced with this project. For more information see the structures section of the report.

Pavement Design

The pavement design will need to be provided by the region pavement engineer.

Using pavement data obtained from UDOT Asset Management, a preliminary pavement analysis has been provided. The pavement for the project was tested for its rideability, rutting, cracking, wheel path cracking, and skid resistance. From this data a Deighton Total Infrastructure Management System (dTIMS) Model was created to generate a pavement maintenance and rehabilitation plan. The table below summarizes the pavement condition of the project.

Pavement Condition

Direction	Begin	End	RIDE	RUT	CRCK	WPCK	SKID	dTIMS Model Recommendations
NB	34.3	42.2	71.7	67.8	70.0	96.3	59.1	Minor Rehab 2010, High Seal 2018 and Functional Repair 2026
SB	34.3	42.2	71.8	68.0	90.0	91.7	56.8	Minor Rehab 2010, High Seal 2018 and Functional Repair 2026

From the pavement condition model a remaining service life (RSL) of the pavement was determined. The RSL is based on rutting, cracking, and wheel path cracking. The RSL is typically assumed to be the lowest of the RSL. From the RSL a proposed pavement strategy was developed.

Remaining Service Life

Direction	Begin	End	RUT RSL	Crack RSL	WCRACK RSL	Proposed Strategy
NB	34.3	42.2	11.4	12.3	27.3	Minor Rehab 2011 and High Seal 2026
SB	34.3	42.2	11.5	22.1	23.2	Minor Rehab 2011 and High Seal 2026

The 2011 minor rehabilitation will consist of 2” spot rotomilling, 3” in-place cold recycled asphaltic base, 1.5” hot mix asphalt, and 1.5” stone matrix asphalt.

Traffic and Safety Summary (Activity 64C)

An Operational safety report has been completed in a previous concept report for this area (located after the PDC at the end of the appendix). In that report the crash rate and severity of this segment of roadway was higher than the expected crash rate and severity. To determine what was the cause of the higher than expected crash rate and severity, the corridor safety was analyzed by identifying locations with a corridor based high number of severe accidents (accidents level 3 or higher). By geographically analyzing the accident data from 2002 to 2005, accident clusters were identified by determining grouping location of severe accidents. Some of the accident clusters were also verified by comments from UDOT maintenance and public comment.

Accident Clusters

MP	Description
34.2	Speed, caused by SB vehicles coming down 6% grade and speed differential going up the 6% NB grade.
36.2	Steep grades
37.45	Deficient horizontal curve, super does not meet speed. Poor horizontal and vertical sight distance. Icy road on curve do to cold winds coming down from canyon.

The accident clusters were not addressed in this project. The safety of the corridor was addressed in the safety improvements, climbing lane MP 34 to 37, and Black Ridge Curve projects identified in the I-15 Washington County Corridor Study.

The expected traffic and safety work for the project is to consist of bringing guardrail and crash cushions up to standard on the project. Also all signs need to be replaced and if necessary brought to current standard.

Structures Summary (Activity 62C)

Condition of the structures was obtained from UDOT Structure Inventory and Appraisal Sheets. The structures for this project are:

- 1D-644; Black Ridge Interchange
- 3D-644; Black Ridge Interchange
- 0E-1209; Ash Creek Reservoir Spillway
- 1D-633; Kolob Canyon Interchange
- 3D-633; Kolob Canyon Interchange
- 0E-1128; Dry Creek Culvert
- 1D-632; New Harmony Interchange
- 3D-632; New Harmony Interchange

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 3D 644 Agency ID: 3D 644 SR: 93 SD/FO: FO

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	3D 644
Facility Carried 7:	I-15 (SR-15) SBL	Location 9:	BLACK RIDGE INTERCHANGE
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	0
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	36.763 mi
Feature Intersected 6:	CO. RD., INTCHG. X-ROAD		
Latitude 16:	37d 24' 20"	Longitude 17:	113d 14' 17"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 1

Main Span Material/Design 43A/B:

1 Concrete 07 Frame

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	0 None
Deck Protection 108C:	None

AGE AND SERVICE

Year Built 27:	1959	Year Reconstructed 106:	-4
Type of Service on 42A:	6 2d level interchg		
Type of Service under 42B:	1 Highway		
Lanes on 28A:	2	Lanes Under 28B:	2
Detour Length 19:	0.0 mi		
ADT 29:	8,685	Truck ADT 109:	35 %
Year of ADT 30:	2002		

GEOMETRIC DATA

Length Max Span 48:	26.9 ft	Structure Length 49:	30.8 ft
Curb/Sdwlk Width L 50A:	1.6 ft	Curb/Sidewalk Width R 50B:	1.6 ft
Width Curb to Curb 51:	38.1 ft	Width Out to Out 52:	43.0 ft
Approach Roadway Width 32: (w/ shoulders)	38.1 ft	Median 33:	1 Open median
Deck Area:	1,324. sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft
Minimum Vertical Clearance Over Bridge 53:	327.8 ft		
Minimum Vertical Underclearance Reference 54A:	H Hwy beneath struct		
Minimum Vertical Underclearance 54B:	17.3 ft		
Minimum Lateral Underclearance Reference R 55A:	H Hwy beneath struct		
Minimum Lateral Underclearance R 55:	0.0 ft		
Minimum Lateral Underclearance L 56:	0.0 ft		

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	Left of || bridge
Direction of Traffic 102:	1 1-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNI	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58:	7 Good	Super 59:	7 Good	Sub 60:	7 Good
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:		N N/A (NBI)	

LOAD RATING AND POSTING

Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress
Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	0 Substandard	Approach Rail 36C:	1 Meets Standards
Transition 36B:	1 Meets Standards	Approach Rail Ends 36D:	0 Substandard
Str. Evaluation 67:	7	Deck Geometry 68:	6 Equal Min Criteria
Underclearance, Vertical and Horizontal 69:	2 Intolerable - Replace		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 147,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 15,000	Length of Improvement 76:	52.5 ft
Total Cost 96:	$ 243,000	Future ADT 114:	10,552
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	39/3	Unp Conc Slab/AC Ovl	(SF)	1,249	100 %	1,249	0 %	0	0 %	0	0 %	0	0 %	0
2	215/3	R/Conc Abutment	(LF)	85	100 %	85	0 %	0	0 %	0	0 %	0	0 %	0
2	321/3	R/Conc Approach Slab	(SF)	764	0 %	0	100 %	764	0 %	0	0 %	0	0 %	0
2	334/3	Metal Rail Coated	(LF)	217	100 %	217	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 1D 644 Agency ID: 1D 644 SR: 93 SD/FO: FO

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	1D 644
Facility Carried 7:	I-15 (SR-15) NBL	Location 9:	BLACK RIDGE INTERCHANGE
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	0
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	36.763 mi
Feature Intersected 6:	CO. RD., INTCHG. X-ROAD		
Latitude 16:	37d 24' 19"	Longitude 17:	113d 14' 16"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 1

Main Span Material/Design 43A/B:

1 Concrete 07 Frame

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	0 None
Deck Protection 108C:	None

AGE AND SERVICE

Year Built 27:	1959	Year Reconstructed 106:	-4
Type of Service on 42A:	6 2d level interchg		
Type of Service under 42B:	1 Highway		
Lanes on 28A:	2	Lanes Under 28B:	2
Detour Length 19:	0.0 mi		
ADT 29:	8,722	Truck ADT 109:	34 %
Year of ADT 30:	2002		

GEOMETRIC DATA

Length Max Span 48:	26.9 ft	Structure Length 49:	30.8 ft
Curb/Sdwlk Width L 50A:	1.6 ft	Curb/Sidewalk Width R 50B:	1.6 ft
Width Curb to Curb 51:	38.1 ft	Width Out to Out 52:	43.0 ft
Approach Roadway Width 32: (w/ shoulders)	38.1 ft	Median 33:	1 Open median
Deck Area:	1,324. sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft
Minimum Vertical Clearance Over Bridge 53:	327.8 ft		
Minimum Vertical Underclearance Reference 54A:	H Hwy beneath struct		
Minimum Vertical Underclearance 54B:	17.3 ft		
Minimum Lateral Underclearance Reference R 55A:	H Hwy beneath struct		
Minimum Lateral Underclearance R 55:	0.0 ft		
Minimum Lateral Underclearance L 56:	0.0 ft		

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	Right of || bridge
Direction of Traffic 102:	1 1-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNI	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58:	7 Good	Super 59:	8 Very Good	Sub 60:	6 Satisfactory
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:	N N/A (NBI)		

LOAD RATING AND POSTING

Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress
Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	0 Substandard	Approach Rail 36C:	1 Meets Standards
Transition 36B:	0 Substandard	Approach Rail Ends 36D:	1 Meets Standards
Str. Evaluation 67:	6	Deck Geometry 68:	6 Equal Min Criteria
Underclearance, Vertical and Horizontal 69:	2 Intolerable - Replace		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 147,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 15,000	Length of Improvement 76:	52.5 ft
Total Cost 96:	$ 243,000	Future ADT 114:	10,597
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	39/2	Unp Conc Slab/AC Ovl	(SF)	1,249	100 %	1,249	0 %	0	0 %	0	0 %	0	0 %	0
2	215/2	R/Conc Abutment	(LF)	85	100 %	85	0 %	0	0 %	0	0 %	0	0 %	0
2	321/2	R/Conc Approach Slab	(SF)	764	100 %	764	0 %	0	0 %	0	0 %	0	0 %	0
2	334/2	Metal Rail Coated	(LF)	325	100 %	325	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 0E1209 Agency ID: 0E1209 SR: 70 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	0E1209
Facility Carried 7:	I-15 (SR-15)NB&SB	Location 9:	0.5 MI.NO.BLACK RIDGE INT
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	0
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	37.221 mi
Feature Intersected 6:	ASH CREEK RES. SPILLWAY		
Latitude 16:	37d 24' 41"	Longitude 17:	113d 14' 07"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 1

Main Span Material/Design 43A/B:

1 Concrete 19 Culvert

Deck Type 107:	N N/A (NBI)
Wearing Surface 108A:	N N/A (no deck (NBI))
Membrane 108B:	N N/A (no deck (NBI))
Deck Protection 108C:	N N/A (no deck (NBI))

AGE AND SERVICE

Year Built 27:	1960	Year Reconstructed 106:	-4
Type of Service on 42A:	1 Highway		
Type of Service under 42B:	5 Waterway		
Lanes on 28A:	4	Lanes Under 28B:	0
Detour Length 19:	19.9 mi		
ADT 29:	17,369	Truck ADT 109:	35 %
Year of ADT 30:	2002		

GEOMETRIC DATA

Length Max Span 48:	24.9 ft	Structure Length 49:	27.9 ft
Curb/Sdwlk Width L 50A:	0.0 ft	Curb/Sidewalk Width R 50B:	0.0 ft
Width Curb to Curb 51:	0.0 ft	Width Out to Out 52:	0.0 ft
Approach Roadway Width 32: (w/ shoulders)	76.1 ft	Median 33:	2 Closed Med w/o Barrier
Deck Area:			
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft
Minimum Vertical Clearance Over Bridge 53:	328.1 ft		
Minimum Vertical Underclearance Reference 54A:	N Feature not hwy or RR		
Minimum Vertical Underclearance 54B:	0.0 ft		
Minimum Lateral Underclearance Reference R 55A:	N Feature not hwy or RR		
Minimum Lateral Underclearance R 55:	0.0 ft		
Minimum Lateral Underclearance L 56:	0.0 ft		

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	No || bridge exists
Direction of Traffic 102:	2 2-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNI	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58:	N N/A (NBI)	Super 59:	N N/A (NBI)	Sub 60:	N N/A (NBI)
Culvert 62:	7 Minor Deterioration	Channel/Channel Protection 61:	7 Minor Damage		

LOAD RATING AND POSTING

Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress
Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	N N/A or not required	Approach Rail 36C:	1 Meets Standards
Transition 36B:	N N/A or not required	Approach Rail Ends 36D:	1 Meets Standards
Str. Evaluation 67:	7	Deck Geometry 68:	N Not applicable (NBI)
Underclearance, Vertical and Horizontal 69:	N Not applicable (NBI)		
Waterway Adequacy 71:	8 Equal Desirable	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	8 Stable Above Footing		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 209,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 21,000	Length of Improvement 76:	49.2 ft
Total Cost 96:	$ 345,000	Future ADT 114:	21,103
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	1 Not Required	Lift Bridge Vertical Clearance 116:	

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	241/2	Concrete Culvert	(LF)	135	99 %	135	1 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 3D 633 Agency ID: 3D 633 SR: 93.5 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	3D 633
Facility Carried 7:	I-15 (SR-15) SBL	Location 9:	KOLOB CANYON INTERCHANGE
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	0
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	40.253 mi
Feature Intersected 6:	PARK ROAD-INTER X-ROAD		
Latitude 16:	37d 27' 17"	Longitude 17:	113d 13' 41"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	Left of || bridge
Direction of Traffic 102:	1 1-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNI	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 3

Main Span Material/Design 43A/B:

2 Concrete Continuous 04 Tee Beam

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	0 None
Deck Protection 108C:	None

CONDITION

Deck 58:	6 Satisfactory	Super 59:	7 Good	Sub 60:	7 Good
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:		N N/A (NBI)	

AGE AND SERVICE

Year Built 27:	1959	Year Reconstructed 106:	-4		
Type of Service on 42A:	6 2d level interchg				
Type of Service under 42B:	1 Highway				
Lanes on 28A:	2	Lanes Under 28B:	2	Detour Length 19:	0.0 mi
ADT 29:	8,685	Truck ADT 109:	35 %	Year of ADT 30:	2002

LOAD RATING AND POSTING

Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress
Inventory Rating 66:	HS19.0	Operating Rating 64:	HS19.0
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

GEOMETRIC DATA

Length Max Span 48:	44.9 ft	Structure Length 49:	126.0 ft
Curb/Sdwlk Width L 50A:	2.3 ft	Curb/Sidewalk Width R 50B:	2.3 ft
Width Curb to Curb 51:	38.1 ft	Width Out to Out 52:	44.0 ft
Approach Roadway Width 32: (w/ shoulders)	38.1 ft	Median 33:	1 Open median
Deck Area:	5,543.4 sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft
Minimum Vertical Clearance Over Bridge 53:	328.1 ft		
Minimum Vertical Underclearance Reference 54A:	H Hwy beneath struct		
Minimum Vertical Underclearance 54B:	16.2 ft		
Minimum Lateral Underclearance Reference R 55A:	H Hwy beneath struct		
Minimum Lateral Underclearance R 55:	8.9 ft		
Minimum Lateral Underclearance L 56:	0.0 ft		

APPRAISAL

Bridge Rail 36A:	0 Substandard	Approach Rail 36C:	0 Substandard
Transition 36B:	0 Substandard	Approach Rail Ends 36D:	0 Substandard
Str. Evaluation 67:	7	Deck Geometry 68:	6 Equal Min Criteria
Underclearance, Vertical and Horizontal 69:	5 Above Tolerable		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 435,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 44,000	Length of Improvement 76:	157.5 ft
Total Cost 96:	$ 719,000	Future ADT 114:	10,552
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	13/3	Unp Conc Deck/AC Ovl	(SF)	5,436	0 %	0	100 %	5,436	0 %	0	0 %	0	0 %	0
2	110/2	R/Conc Open Girder	(LF)	741	90 %	666	10 %	75	0 %	0	0 %	0	0 %	0
2	205/2	R/Conc Column	(EA)	6	100 %	6	0 %	0	0 %	0	0 %	0	0 %	0
2	215/2	R/Conc Abutment	(LF)	89	100 %	89	0 %	0	0 %	0	0 %	0	0 %	0
2	234/2	R/Conc Cap	(LF)	92	100 %	92	0 %	0	0 %	0	0 %	0	0 %	0
2	301/3	Pourable Joint Seal	(LF)	89	0 %	0	100 %	89	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	311/2	Moveable Bearing	(EA)	18	94 %	17	6 %	1	0 %	0	0 %	0	0 %	0
2	313/2	Fixed Bearing	(EA)	6	100 %	6	0 %	0	0 %	0	0 %	0	0 %	0
2	321/3	R/Conc Approach Slab	(SF)	872	100 %	872	0 %	0	0 %	0	0 %	0	0 %	0
2	334/3	Metal Rail Coated	(LF)	269	50 %	135	50 %	135	0 %	0	0 %	0	0 %	0
2	359/2	Soffit Smart Flag	(EA)	1	100 %	1	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 1D 633 Agency ID: 1D 633 SR: 94 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	1D 633
Facility Carried 7:	I-15 (SR-15) NBL	Location 9:	KOLOB CANYON INTERCHANGE
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	0
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	40.253 mi
Feature Intersected 6:	PARK ROAD-INTER X-ROAD		
Latitude 16:	37d 27' 16"	Longitude 17:	113d 13' 40"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 3

Main Span Material/Design 43A/B:

2 Concrete Continuous 04 Tee Beam

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	0 None
Deck Protection 108C:	None

AGE AND SERVICE

Year Built 27: 1959 Year Reconstructed 106: -4

Type of Service on 42A: 6 2d level interchg

Type of Service under 42B: 1 Highway

Lanes on 28A: 2 Lanes Under 28B: 2 Detour Length 19: 0.0 mi

ADT 29: 8,722 Truck ADT 109: 34 % Year of ADT 30: 2002

GEOMETRIC DATA

Length Max Span 48:	44.9 ft	Structure Length 49:	126.0 ft
Curb/Sdwlk Width L 50A:	2.3 ft	Curb/Sidewalk Width R 50B:	2.3 ft
Width Curb to Curb 51:	38.1 ft	Width Out to Out 52:	44.0 ft
Approach Roadway Width 32: (w/ shoulders)	38.1 ft	Median 33:	1 Open median
Deck Area:	5,543.4 sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft

Minimum Vertical Clearance Over Bridge 53:	328.1 ft
Minimum Vertical Underclearance Reference 54A:	H Hwy beneath struct
Minimum Vertical Underclearance 54B:	16.2 ft
Minimum Lateral Underclearance Reference R 55A:	H Hwy beneath struct
Minimum Lateral Underclearance R 55:	8.9 ft
Minimum Lateral Underclearance L 56:	0.0 ft

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	Right of || bridge
Direction of Traffic 102:	1 1-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNI	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58: 7 Good Super 59: 7 Good Sub 60: 7 Good

Culvert 62: N N/A (NBI) Channel/Channel Protection 61: N N/A (NBI)

LOAD RATING AND POSTING

Inventory Rating Method 65: 2 AS Allowable Stress Operating Rating Method 63: 2 AS Allowable Stress

Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	0 Substandard	Approach Rail 36C:	0 Substandard
Transition 36B:	0 Substandard	Approach Rail Ends 36D:	0 Substandard
Str. Evaluation 67:	7	Deck Geometry 68:	6 Equal Min Criteria
Underclearance, Vertical and Horizontal 69:	5 Above Tolerable		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 435,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 44,000	Length of Improvement 76:	157.5 ft
Total Cost 96:	$ 719,000	Future ADT 114:	10,597
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	13/3	Unp Conc Deck/AC Ovl	(SF)	5,436	100 %	5,436	0 %	0	0 %	0	0 %	0	0 %	0
2	110/2	R/Conc Open Girder	(LF)	741	90 %	666	10 %	75	0 %	0	0 %	0	0 %	0
2	205/2	R/Conc Column	(EA)	6	100 %	6	0 %	0	0 %	0	0 %	0	0 %	0
2	215/3	R/Conc Abutment	(LF)	89	100 %	89	0 %	0	0 %	0	0 %	0	0 %	0
2	234/2	R/Conc Cap	(LF)	92	100 %	92	0 %	0	0 %	0	0 %	0	0 %	0
2	301/3	Pourable Joint Seal	(LF)	89	0 %	0	100 %	89	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	311/2	Moveable Bearing	(EA)	18	100 %	18	0 %	0	0 %	0	0 %	0	0 %	0
2	313/2	Fixed Bearing	(EA)	6	100 %	6	0 %	0	0 %	0	0 %	0	0 %	0
2	321/3	R/Conc Approach Slab	(SF)	872	100 %	872	0 %	0	0 %	0	0 %	0	0 %	0
2	334/3	Metal Rail Coated	(LF)	266	0 %	0	80 %	213	20 %	52	0 %	0	0 %	0
2	359/2	Soffit Smart Flag	(EA)	1	100 %	1	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 0E1128 Agency ID: 0E1128 SR: 65 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	0E1128
Facility Carried 7:	I-15 (SR-15)NB&SB	Location 9:	0.6 MI NO KOLOB CAN. INT.
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	NA
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	40.857 mi
Feature Intersected 6:	DRY CREEK		
Latitude 16:	37d 27' 47"	Longitude 17:	113d 13' 33"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 1

Main Span Material/Design 43A/B:

1 Concrete 19 Culvert

Deck Type 107:	N N/A (NBI)
Wearing Surface 108A:	N N/A (no deck (NBI))
Membrane 108B:	N N/A (no deck (NBI))
Deck Protection 108C:	N N/A (no deck (NBI))

AGE AND SERVICE

Year Built 27:	1959	Year Reconstructed 106:	Unknown
Type of Service on 42A:	1 Highway		
Type of Service under 42B:	5 Waterway		
Lanes on 28A:	4	Lanes Under 28B:	0
Detour Length 19:	123.7 m		
ADT 29:	17,369	Truck ADT 109:	35 %
Year of ADT 30:	2002		

GEOMETRIC DATA

Length Max Span 48:	27.9 ft	Structure Length 49:	27.9 ft
Curb/Sdwlk Width L 50A:	0.0 ft	Curb/Sidewalk Width R 50B:	0.0 ft
Width Curb to Curb 51:	0.0 ft	Width Out to Out 52:	0.0 ft
Approach Roadway Width 32: (w/ shoulders)	76.1 ft	Median 33:	2 Closed Med w/o Barrier
Deck Area:			
Skew 34:	30.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft
Minimum Vertical Clearance Over Bridge 53:	328.1 ft		
Minimum Vertical Underclearance Reference 54A:	N Feature not hwy or RR		
Minimum Vertical Underclearance 54B:	0.0 ft		
Minimum Lateral Underclearance Reference R 55A:	N Feature not hwy or RR		
Minimum Lateral Underclearance R 55:	0.0 ft		
Minimum Lateral Underclearance L 56:	0.0 ft		

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	No || bridge exists
Direction of Traffic 102:	2 2-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNI	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58:	N N/A (NBI)	Super 59:	N N/A (NBI)	Sub 60:	N N/A (NBI)
Culvert 62:	7 Minor Deterioration	Channel/Channel Protection 61:	7 Minor Damage		

LOAD RATING AND POSTING

Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress
Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	N N/A or not required	Approach Rail 36C:	1 Meets Standards
Transition 36B:	N N/A or not required	Approach Rail Ends 36D:	0 Substandard
Str. Evaluation 67:	7	Deck Geometry 68:	N Not applicable (NBI)
Underclearance, Vertical and Horizontal 69:	N Not applicable (NBI)		
Waterway Adequacy 71:	6 Equal Minimum	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	8 Stable Above Footing		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 218,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 22,000	Length of Improvement 76:	52.5 ft
Total Cost 96:	$ 360,000	Future ADT 114:	21,103
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	1 Not Required	Lift Bridge Vertical Clearance 116:	

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	241/2	Concrete Culvert	(LF)	246	100 %	246	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 1D 632 Agency ID: 1D 632 SR: 93 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	1D 632
Facility Carried 7:	I-15 (SR-15) NBL	Location 9:	NEW HARMONY INTERCHANGE
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	0
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	42.159 mi
Feature Intersected 6:	NEW HARMONY RD.,INT.X-RD		
Latitude 16:	37d 28' 53"	Longitude 17:	113d 13' 15"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 3

Main Span Material/Design 43A/B:

2 Concrete Continuous 04 Tee Beam

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	0 None
Deck Protection 108C:	None

AGE AND SERVICE

Year Built 27: 1959 Year Reconstructed 106: -4

Type of Service on 42A: 6 2d level interchg

Type of Service under 42B: 1 Highway

Lanes on 28A: 2 Lanes Under 28B: 2 Detour Length 19: 0.0 mi

ADT 29: 8,684 Truck ADT 109: 34 % Year of ADT 30: 2002

GEOMETRIC DATA

Length Max Span 48:	44.9 ft	Structure Length 49:	126.0 ft
Curb/Sdwlk Width L 50A:	2.3 ft	Curb/Sidewalk Width R 50B:	2.3 ft
Width Curb to Curb 51:	38.1 ft	Width Out to Out 52:	44.0 ft
Approach Roadway Width 32: (w/ shoulders)	38.1 ft	Median 33:	1 Open median
Deck Area:	5,543.4 sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft

Minimum Vertical Clearance Over Bridge 53:	328.1 ft
Minimum Vertical Underclearance Reference 54A:	H Hwy beneath struct
Minimum Vertical Underclearance 54B:	16.4 ft
Minimum Lateral Underclearance Reference R 55A:	H Hwy beneath struct
Minimum Lateral Underclearance R 55:	5.2 ft
Minimum Lateral Underclearance L 56:	0.0 ft

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	Right of || bridge
Direction of Traffic 102:	1 1-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNI	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58:	7 Good	Super 59:	6 Satisfactory	Sub 60:	7 Good
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:		N N/A (NBI)	

LOAD RATING AND POSTING

Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress
Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	0 Substandard	Approach Rail 36C:	0 Substandard
Transition 36B:	0 Substandard	Approach Rail Ends 36D:	0 Substandard
Str. Evaluation 67:	6	Deck Geometry 68:	6 Equal Min Criteria
Underclearance, Vertical and Horizontal 69:	4 Tolerable		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	7 Above Min Criteria
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 435,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 44,000	Length of Improvement 76:	157.5 ft
Total Cost 96:	$ 719,000	Future ADT 114:	10,551
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	13/3	Unp Conc Deck/AC Ovl	(SF)	10,118	100 %	10,118	0 %	0	0 %	0	0 %	0	0 %	0
2	110/2	R/Conc Open Girder	(LF)	1,211	99 %	1,198	1 %	13	0 %	0	0 %	0	0 %	0
2	205/2	R/Conc Column	(EA)	6	100 %	6	0 %	0	0 %	0	0 %	0	0 %	0
2	215/3	R/Conc Abutment	(LF)	89	100 %	89	0 %	0	0 %	0	0 %	0	0 %	0
2	234/2	R/Conc Cap	(LF)	144	100 %	144	0 %	0	0 %	0	0 %	0	0 %	0
2	303/3	Assembly Joint/Seal	(LF)	89	0 %	0	52 %	46	48 %	43	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	311/3	Moveable Bearing	(EA)	24	75 %	18	25 %	6	0 %	0	0 %	0	0 %	0
2	313/2	Fixed Bearing	(EA)	6	100 %	6	0 %	0	0 %	0	0 %	0	0 %	0
2	321/3	R/Conc Approach Slab	(SF)	840	100 %	840	0 %	0	0 %	0	0 %	0	0 %	0
2	334/3	Metal Rail Coated	(LF)	417	100 %	417	0 %	0	0 %	0	0 %	0	0 %	0
2	359/2	Soffit Smart Flag	(EA)	1	0 %	0	100 %	1	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 3D 632 Agency ID: 3D 632 SR: 94 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	3D 632
Facility Carried 7:	I-15 (SR-15) SBL	Location 9:	NEW HARMONY INTERCHANGE
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	0
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	42.159 mi
Feature Intersected 6:	NEW HARMONY RD.,INT.X-RD		
Latitude 16:	37d 28' 55"	Longitude 17:	113d 13' 16"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 3

Main Span Material/Design 43A/B:

2 Concrete Continuous 04 Tee Beam

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	0 None
Deck Protection 108C:	None

AGE AND SERVICE

Year Built 27: 1959 Year Reconstructed 106: -4

Type of Service on 42A: 6 2d level interchg

Type of Service under 42B: 1 Highway

Lanes on 28A: 2 Lanes Under 28B: 2 Detour Length 19: 0.0 mi

ADT 29: 8,685 Truck ADT 109: 35 % Year of ADT 30: 2002

GEOMETRIC DATA

Length Max Span 48:	45.9 ft	Structure Length 49:	124.7 ft
Curb/Sdwlk Width L 50A:	3.3 ft	Curb/Sidewalk Width R 50B:	3.3 ft
Width Curb to Curb 51:	38.1 ft	Width Out to Out 52:	42.7 ft
Approach Roadway Width 32: (w/ shoulders)	38.1 ft	Median 33:	1 Open median
Deck Area:	5,543.4 sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft

Minimum Vertical Clearance Over Bridge 53: 328.1 ft

Minimum Vertical Underclearance Reference 54A: H Hwy beneath struct

Minimum Vertical Underclearance 54B: 16.4 ft

Minimum Lateral Underclearance Reference R 55A: H Hwy beneath struct

Minimum Lateral Underclearance R 55: 5.2 ft

Minimum Lateral Underclearance L 56: 0.0 ft

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	Left of || bridge
Direction of Traffic 102:	1 1-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNI	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58: 7 Good Super 59: 7 Good Sub 60: 7 Good

Culvert 62: N N/A (NBI) Channel/Channel Protection 61: N N/A (NBI)

LOAD RATING AND POSTING

Inventory Rating Method 65: 2 AS Allowable Stress Operating Rating Method 63: 2 AS Allowable Stress

Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	0 Substandard	Approach Rail 36C:	1 Meets Standards
Transition 36B:	0 Substandard	Approach Rail Ends 36D:	0 Substandard
Str. Evaluation 67:	7	Deck Geometry 68:	6 Equal Min Criteria
Underclearance, Vertical and Horizontal 69:	4 Tolerable		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 435,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 44,000	Length of Improvement 76:	157.5 ft
Total Cost 96:	$ 719,000	Future ADT 114:	10,552
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38: N NA-no waterway

Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	13/3	Unp Conc Deck/AC Ovl	(SF)	5,436	100 %	5,436	0 %	0	0 %	0	0 %	0	0 %	0
2	110/2	R/Conc Open Girder	(LF)	738	100 %	738	0 %	0	0 %	0	0 %	0	0 %	0
2	205/2	R/Conc Column	(EA)	6	100 %	6	0 %	0	0 %	0	0 %	0	0 %	0
2	215/2	R/Conc Abutment	(LF)	89	100 %	89	0 %	0	0 %	0	0 %	0	0 %	0
2	234/2	R/Conc Cap	(LF)	92	100 %	92	0 %	0	0 %	0	0 %	0	0 %	0
2	301/3	Pourable Joint Seal	(LF)	89	100 %	89	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	311/2	Moveable Bearing	(EA)	19	78 %	14	28 %	5	0 %	0	0 %	0	0 %	0
2	313/2	Fixed Bearing	(EA)	6	100 %	6	0 %	0	0 %	0	0 %	0	0 %	0
2	321/3	R/Conc Approach Slab	(SF)	872	100 %	872	0 %	0	0 %	0	0 %	0	0 %	0
2	334/3	Metal Rail Coated	(LF)	266	100 %	266	0 %	0	0 %	0	0 %	0	0 %	0
2	359/2	Soffit Smart Flag	(EA)	1	100 %	1	0 %	0	0 %	0	0 %	0	0 %	0
2	360/2	Settlement SmFlag	(EA)	0	0 %	0	0 %	0	0 %	0	0 %	0	0 %	0

The structural plan is to perform preventive maintenance treatments to Black Ridge interchange, Kolob Interchange, and New Harmony Interchange. The Ash Creek Reservoir Spillway will need to be widened for future use and the Dry Creek Culvert will need to be replaced to accommodate flows.

The Ash Creek Reservoir widening will need to coordinate the design of the following projects, Improve Black Ridge Curve and Northern Interchanges, Pavement Rehabilitation (MP 34 to 42), and Climbing Lane (MP 34 to 37) projects as identified in the I-15 Washington County Corridor Study.

The work items that will need to be completed as part of the preventative maintenance are:

- Asphalt surfacing removal (structures)
- Pothole patching (deck only)
- Waterproofing membrane (deck and approach slabs)
- 2" hot mix asphalt overlay
- 1" open graded surface course
- Seal parapets
- Joint replacement

Environmental Summary (Activity 52C)

A categorical exclusion is the expected level of environmental documentation of the project.

Cultural and Paleontological

A significant number of cultural sites can be expected in this area. A few archeological studies have been performed on the parts of the project area. There is one ineligible documented cultural site from those surveys of the project. No impact to this site is expected. A cultural inventory within the project area will be needed to determine the extent of cultural sites in the area.

Wetlands

No wetlands impacts are anticipated. Proper erosion control including rip rap, vegetation, and other techniques should be used throughout the project.

Threatened and Endangered Species

Utah Prairie Dog - Areas of possible high value habitat exist along the northern portion of the corridor (MP 40-42). No critical habitat has been designated for this species. Currently there are no known populations in Washington County. A survey may be required to determine if colonies are in the project limits and what impacts the project could have on them.

Bald Eagle - Wintering habitat only. No known winter roost sites or nest sites within 0.5-mile of I-15 corridor.

California Condor - Possible fly over. Possible habitat locations are the cliffs of Black Ridge, Kolob Terrace, and Zion National Park. Condors have not been seen in this area; they are found southeast of St. George in the Vermillion Cliffs. It is possible that future pairs could nest in the cliffs found along the northern section of I-15 in Washington County.

Mexican Spotted Owl - Habitat found in the cliffs at northern end of I-15 corridor in Zion National Park Kolob District. Federally designated critical habitat is within 0.5 mile east of the corridor (MP- 30-42). 2 years of survey with 4 surveys each year are required for spotted owls if suitable habitat is within 0.5 air miles of the construction area. A detail survey will only be required if suitable habitat is found in the initial survey. Survey season March 1 – August 31. Breeding season for the owls is March 15 – August 31.

Wildlife

Critical deer winter range exists throughout the project. The wildlife connectivity issues in this area are rated as "critical" for connectivity linkage zone #4-11 (se UDOT publication "Wildlife Connectivity across Utah's Highways" June 2006) for deer, raptors, and cougar. An adequate number of crossings already exist if they are maintained to serve as crossings. The project is currently fenced with livestock fencing in poor condition. This fence needs to be replaced with the current standard wildlife fence.

This project does not address wildlife issues, but deer fence is recommended in a phase III project as identified in the I-15 Washington County Corridor Study.

Right of Way Summary (Activity 56C)

No right-of-way impacts expected.

Utility and Railroad Summary (Activity 68C)

No utility or railroad conflicts identified.

ITS Summary (Activity 66C)

No ITS improvements are to be completed with this project. Consideration should be given to adding a VMS and RWIS system. This is needed to warn truck and other traffic of poor weather conditions on the Black Ridge.

Public Involvement Summary (Activity 60C)

The public involvement plan is to coordinate with local municipalities, Port of Entry, Truckers Association, Tourism Bureau, and local media, on project construction schedule and traffic impacts.

PROJECT DESIGN CRITERIA

I. PROJECT DESCRIPTION

Date: January 17, 2008

Project Name	**I-15 Corridor Study, Washington County MP 0 to 42**		
Project Number	**S-R499(48)**	PIN	**6361**

Describe the scope of the project: A corridor study for I-15 from the Arizona State Line (MP 0) in Washington County to the New Harmony Interchange (MP 42) in Washington County. The purpose of the project is to identify corridor needs and constraints, provide solutions, prioritize and develop a schedule for implementing those solutions, and provide concept reports for immediate projects. Projects identified will be included on the STIP. The time period for the corridor study includes analysis for the current year 2007 and the next 30 years (2040).

II. DESIGN STANDARDS BY ROADWAY (complete for each roadway on your project)

ROADWAY: I-15, MP 0.0 to MP 11.5

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**70 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	70 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft								
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504-505 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	2040 ft			Mainline					

I-15, MP 0.0 to MP 11.5 (continued)

12 Critical Elements	UDOT Standard			Proposed			Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value		Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Mainline	181	247	Mainline				
Profile Grades	% Min		% Max	% Min		% Max		AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5					
Stopping-Sight Distance	Minimum			Minimum				AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	730 ft		Mainline				
Cross Slope	Minimum							AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%							
Superelevation	Maximum Superelevation (UDOT Standard)							UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%							
Structural Capacity	Design Loading							Reference roadway design MOI, pg 288
	HS20 existing bridges HL-93 new structures							
Vertical Clearance*	Minimum							UDOT Roadway Design MOI p. 64
	16 feet 6 inches							
Bridge Width	Minimum							UDOT Roadway Design MOI p. 63
	Add 2 ft to travel way to each side of bridge							

I-15, MP 0.0 to MP 11.5 (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: I-15, MP 11.5 to MP 42

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**80 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	80 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft				.				
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	3050 ft			Mainline					
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value			AASHTO GB p. 272 & 277
	Mainline	231	384		Mainline					
Profile Grades	% Min		% Max		% Min		% Max			AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5							
Stopping-Sight Distance	Minimum				Minimum					AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	910 ft			Mainline					
Cross Slope	Minimum									AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%									
Superelevation	Maximum Superelevation (UDOT Standard)									UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%									

I-15, MP 11.5 to MP 42

12 Critical Elements	UDOT Standard	Proposed	Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Structural Capacity	Design Loading HS20 existing bridges HL-93 new structures			Reference roadway design MOI, pg 288
Vertical Clearance*	Minimum 16 feet 6 inches			UDOT Roadway Design MOI p. 64
Bridge Width	Minimum Add 2 ft to travel way to each side of bridge			UDOT Roadway Design MOI p. 63

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft (not in roadside table)			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General Off Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General Off Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	40 mph or less 14 ft to 16 ft 50 mph 18 ft to 20 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1 sideslope
Ramp Terminal Sight Distance	25 mph – 155 ft			AASHTO GB p. 828
Ramp Design	UDOT STD DWG DD 6			AASHTO GB p. 825+
Gores	UDOT STD DWG DD 6			AASHTO GB p. 832-837
Ramp Terminals	UDOT STD DWG DD 6			AASHTO GB p. 840-845
Ramp Entrances	UDOT STD DWG DD 6			AASHTO GB p. 845
Acceleration Lanes	AASHTO p. 847, 848			
Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General Off Ramp (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Guardrail Bridge Connection	N/A			
Sideslopes	6:1 in clear zone			UDOT STD DWG DD 4 AASHTO GB p. 326-329
Intersection Sight Distance	UDOT Roadway Design MOI p. 127-128 AASHTO GB p. 650-677			
Shoulder/Travel way (gutter pan)	Gutter pan not included in travelway or shoulder			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General On Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	**See attached**	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General On Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	40 mph or less 14 ft to 16 ft 50 mph 18 ft to 20 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1 sideslope
Ramp Terminal Sight Distance	25 mph – 155 ft			AASHTO GB p. 828
Ramp Design	UDOT STD DWG DD 6			AASHTO GB p. 825+
Gores	UDOT STD DWG DD 6			AASHTO GB p. 832-837
Ramp Terminals	UDOT STD DWG DD 6			AASHTO GB p. 840-845
Ramp Entrances	UDOT STD DWG DD 6			AASHTO GB p. 845
Acceleration Lanes	AASHTO p. 847, 848			
Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General On Ramp (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Guardrail Bridge Connection	N/A			
Sideslopes	6:1 in clear zone			UDOT STD DWG DD 4 AASHTO GB p. 326-329
Intersection Sight Distance	UDOT Roadway Design MOI p. 127-128 AASHTO GB p. 650-677			
Shoulder/Travel way (gutter pan)	Gutter pan not included in travelway or shoulder			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

Prepared by:_____ Phone Number:_____

Verified Only - Region Preconstruction Engineer:_____ Date:_____

Approved by Region Preconstruction Engineer, Consulting Engineer,
or Local Government Engineer:_____ Date:_____

Required Signatures

Local government projects require Regional Preconstruction Engineer signature for verification and the Local Government Engineer signature for approval.
Local government projects on State highway system require the Region Preconstruction Engineer signature for approval.
All other projects require Region Preconstruction Engineer signature for approval.

MEMORANDUM UTAH DEPARTMENT OF TRANSPORTATION

Date: September 23, 2005

TO: Silvia Barbre
R-4, Design Technician III

FROM: John L. Leonard, P.E.
Traffic & Safety Operations Engineer

SUBJECT: Preliminary Operational Safety Report; Project No. IM-15-1()34; I-15; Black Ridge to Iron County Line; RP 34 to RP 42

We have evaluated the crash history for the subject section of I-15 for the three-year period of 2002 through 2004, with the following results:

RURAL INTERSTATE		ACTUAL				EXPECTED
		2002	2003	2004	TOTAL/AVG	
Number of Crashes		44	49	58	151/50.33	
Crash Rate		0.92	0.99	1.17	1.03	0.92
Severity		2.32	2.14	1.88	2.11	1.82
Single Vehicle Crashes	83.4 %				126	
Same Direction Side Swipe	9.9 %				15	

Crash data indicates that both the crash rate and severity of this section are higher than the expected. The predominant crash types are listed on the table above. Single vehicle crashes, being the most predominant, were distributed by type and number as follows:

CRASH TYPE	NUMBER	% OF SINGLE VEHICLE CRASHES
Ran Off Road Right	34	26.9 %
Ran Off Road Through Median	29	23.0 %
Ran Off Road Left	28	22.2 %
Wildlife Related	21	16.7 %
Fixed Object	7	5.6 %
Overturned in Roadway	3	2.4 %
MV – Other Object	2	1.6 %
Other Non-Collision	2	1.6 %
TOTAL	126	100.0 %

No clusters of crashes were observed at any particular location. There were six fatal crashes, which resulted in six fatalities. With only one exception, three crashes occurred in dry weather conditions. Contributing factors included for the most part excessive speed, a head on collision caused by one vehicle driving north on the southbound lanes, and one run off the road crash caused by a drunk driver.

Source documents are available at the Division of Traffic and Safety for additional analysis. If questions arise, please call me at 965-4045.

JL/EG/NF
Attachments

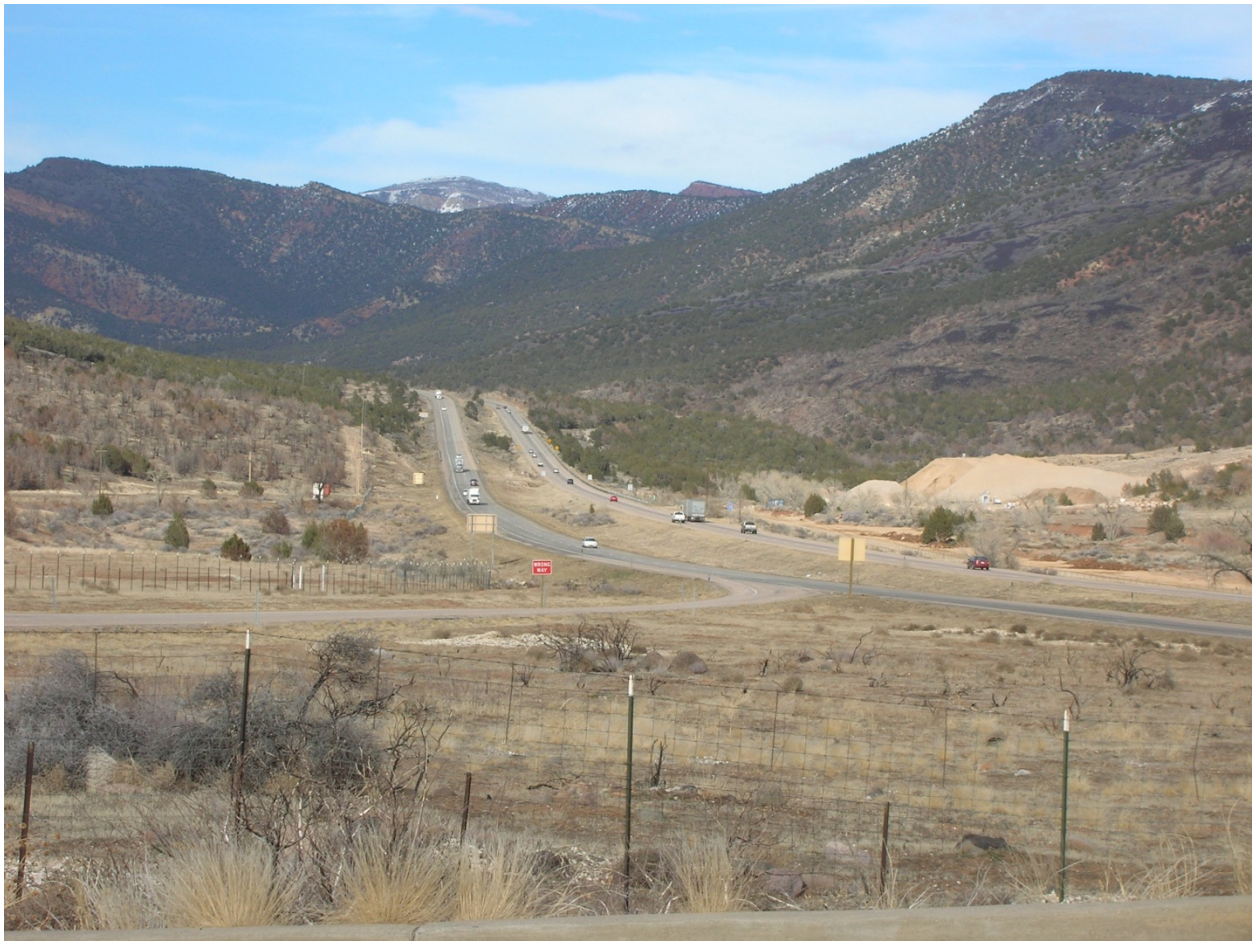
cc: Robert Hull
John Leonard
Roland Stanger, FHWA
Eric Cheng
Zeke González
Troy Torgersen, R-4

UTAH DEPARTMENT OF TRANSPORTATION
Region 4

CONCEPT REPORT
For

Climbing Lane (MP 34 to 37)

October 28, 2008



CONCEPT REPORT
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ITS Summary (Activity 66C)
Public Involvement Summary (Activity 60C)

CONCEPT REPORT SUMMARY

SECTION 1: General Information

Project Name:	**Climbing Lane (MP 34 to 37)**		
Project Manager:	**Kim Manwill**	**County:**	**Washington**
Pin Number:		**Begin Mile Post:**	**34.1**
Project Number:		**End Mile Post:**	**37.1**
Route Number:	**15**	**Design Year:**	**2012**
Functional Classification:	**Interstate**	**Design Speed:**	**80 mph**

Describe the Purpose/Need for this Project:

The purpose of this project is to provide a climbing lane in the NB direction to prevent the existing speed differential problem on the Black Ridge. The Black Ridge contains a 3 mile section of steep grades, up to 6%. This creates a speed differential between trucks and other vehicles on I-15. This problem can be particularly compounding in poor weather conditions.

Major Project Risks:

- Walls – Due to the limited space and steep slopes on the Black Ridge walls could be needed. Another option could be to widen into the median at locations with limited space. It is felt this could be done effectively, so no wall cost was added.
- The climbing lane addresses the accidents on the NB direction, but does not address the speed differential on the SB direction. Vehicles frequently travel the SB section of the Black Ridge at excessive speeds, which also creates a speed differential safety issue. Consideration should be given to sign, patrol, or use another method to improve this issue.

Project Estimate and Timeline:

Planning Estimate:		**Proposed Construction FY:**	**2012**
Total Project Cost (Current Year):	**$6,325,100**	**Estimated Construction Duration:**	*1 year*
Construction Year Estimate (2011):	**$8,250,000**	**Recommended Commission Approved Amount:**	

Signature Block:

Project Manager **Date**	**Region Preconstruction Engineer** **Date**
Region STIP Workshop Chair **Date**	**Region Director** **Date**
Consultant **Date**	

SECTION 2: Design Information (Executive Summary)

Roadway / Pavement Summary (Activities 54C, 58C)	**Estimated Construction Cost:**	**$5,347,000**
Several deficiencies exist on the corridor those deficiencies include: horizontal alignments, vertical alignments, stopping sight distance, clear zone, guardrail, and ramp deficiencies. These deficiencies will be addressed by other projects, as identified in the I-15 Washington County Corridor Study. The goal of this project is to add a climbing lane. Design exceptions will be needed for the vertical and horizontal alignments. All other deficiencies should be corrected, prior to this project, with previous projects as identified in the I-15 Washington County Corridor Study. No drainage issues were identified. A pavement preliminary pavement section has been recommended consisting of 12" GB, 8.5" UTBC, 9.5" HMA, and 1.5" SMA. The capacity analysis for the project showed that a climbing lane is needed on the Black Ridge in 2040 to maintain an appropriate LOS on the corridor. No other capacity improvements were identified on the project.		

Traffic and Safety Summary (Activity 64C)	**Estimated Construction Cost:**	**$228,000**
Barrier will be placed as necessary to ensure safe travel on the corridor.		

Structures Summary (Activity 62C)	**Estimated Construction Cost:**	**$0**
No structural work to be completed on this project.		

Environmental Summary (Activity 52C)	**Estimated Mitigation Cost:**	**$0**
A categorical exclusion is the expected level of environmental documentation of the project. Several sensitive species have been identified as having potential habitat within 0.5 mile of the corridor. These are Utah Prairie Dog, Bald Eagle, and California Condor. Survey will be required to determine if these species have habitat near the corridor. Mitigation would include limited construction during nesting season and silt fencing for the Utah Prairie Dogs. The Mexican Spotted Owl has designated critical habitat within 0.5 mile of the corridor. The Mexican Spotted Owl will require survey to be preformed 2 years prior to		

construction. The Mitigation plan would be to discourage the owls from nesting or to avoid construction during the nesting season March through August.

The environmental documentation cost has been included in the PE cost in the cost estimate. The environmental mitigation cost includes silt fence, erosion control, and check dams.

Right of Way Summary (Activity 56C)	**Estimated Property Cost:**	**$0**
No Right-of-Way impacts or acquisition expected.		

Utility and Railroad Summary (Activity 68C)	**Estimated Relocation Cost:**	**$0**
No utility or railroad conflicts expected.		

ITS Summary (Activity 66C)	**Estimated Construction Cost:**	**$0**
No ITS improvements on this project.		

Public Involvement Summary (Activity 60C)	**Estimated Cost:**	**$15,000**
The public involvement plan is to coordinate with local municipalities, Port of Entry, Truckers Association, Tourism Bureau, and local media, on project construction schedule and traffic impacts.		

Miscellaneous Summary:

This project is to be designed in coordination of the other projects in the area as identified in the I-15 Washington County Corridor Study. The three projects to be considered are, Improve Black Ridge Curve and Northern Interchanges, Pavement Rehabilitation (MP 34 to 42), and Climbing Lane (MP 34 to 37). Consideration should be given to add as many additional pieces of the Improve Black Ridge Curve and Northern Interchanges and Climbing Lane (MP 34 to 37) projects to the Pavement Rehabilitation (MP 34 to 42) project. Those project elements include adding acceleration and deceleration lengths to Interchanges 36, 40, and 42, add a climbing lane MP 34 to 37, and realigning the deficient curve at MP 37.5.

The total construction cost includes concept report cost, PE, CE, and a 10% project contingency. See the Concept Estimate following this summary.

CONCEPT REPORT
Appendix A

SECTION 3: Project Log

Complete the Following:

Date Received	Deliverable
	Roadway/Pavement Summary (Activities 54C, 58C)
	Traffic and Safety Summary (Activity 64C)
	Structures Summary (Activity 62C)
	Environmental Summary (Activity 52C)
	Right of Way Summary (Activity 56C)
	Utility and Railroad Summary (Activity 68C)
	ITS Summary (Activity 66C)
	Public Involvement Summary (Activity 60C)

(Update this as major decisions are made regarding the project.)

Date	Decision Made
10/08	Preliminary Concept Report from I-15 Washington County Corridor Study

PIN ----- PROJECT # ----- Climbing Lane (MP 34 to 37)

Cost Estimate - Concept Level

Approximate Route Reference Post (BEGIN) =	34.1	(END) =	37.100	
Accumulated Mileage (BEGIN) =	34.1	(END) =	37.100	
Project Length =	3.000	miles	15,840 ft	
Current Year =	2008			
Assumed Construction Year =	2012			
Assumed Yearly Inflation for Construction and Utility Items (%/yr) =	7.0%	4 yrs for inflation		For projects 1 Year out use 10%, 2 Years 9%,
Assumed Yearly Inflation for Engineering Services (PE and CE) (%/yr) =	6.0%			
Assumed Yearly Inflation for Urban Residential Right of Way (%/yr) =	6.5%			
Assumed Yearly Inflation for Urban Commercial Right of Way (%/yr) =	4.0%			
Assumed Yearly Inflation for non-Urban Right of Way (%/yr) =	2.0%			
Construction Items Contingency (% of Construction) =	10.0%			10% Rural PB; 15% Urban PB; 20% Non PB
Preliminary Engineering (% of Construction + Incentives) =	8.0%			
Construction Engineering (% of Construction + Incentives) =	10.0%			

Item #					Cost	Remarks
Construction						
	Roadway and Drainage				$4,078,980	
	Traffic and Safety				$174,240	
	Structures				$0	
	Environmental Mitigation				$0	
	ITS				$0	
				Subtotal	$4,253,220	
			Construction Items Contingency (for minor items not listed)	(10%)	$425,322	
				Construction Subtotal	**$4,678,542**	
P.E. Cost				**P.E. Subtotal**	**$340,000**	8%
C.E. Cost				**C.E. Subtotal**	**$492,000**	10%
Right of Way Urban/Suburban Residential				**Right of Way Subtotal**	$0	
Right of Way Urban Suburban Commercial				**Right of Way Subtotal**	$0	
Right of Way non-Urban/Suburban				**Right of Way Subtotal**	$0	
Utilities				**Utilities Subtotal**	$0	
Incentives				**Incentives Subtotal**	$237,500	
Miscellaneous				**Miscellaneous Subtotal**	**$0**	

Cost Estimate (ePM screen 505)		2008		2012
Concept Report Cost	0.5%	**$23,000.00**		**$23,000.00**
P.E.		**$340,000**		**$429,000**
Right of Way		**$0**		**$0**
Utilities		**$0**		**$0**
Construction		**$4,679,000**		**$6,133,000**
C.E.		**$492,000**		**$621,000**
Incentives		**$237,000**		**$311,000**
Contingency	**10%**	**$577,100**		**$756,000**
Miscellaneous		**$0**		**$0**
	TOTAL	**$6,325,100**	**TOTAL**	**$8,250,000**

PROPOSED COMMISSION REQUEST	**TOTAL**	**$6,325,100**	**TOTAL**	**$8,250,000**

Cost Estimate Summary of Assumptions - Climbing Lane (MP 34 to 37)

Unit Weights			Application Rates	
Borrow	133	lb/cf		
Gran. Backfill Borrow	133	lb/cf		
Granular Borrow	133	lb/cf		
UTBC	136	lb/cf		
HMA	152	lb/cf		
SMA	149	lb/cf		
Asphalt Cement	6.20%	OGSC		
Prime Coat	250	gal/ton	0.5	gal/sy
Tack Coat	240	gal/ton	0.08	gal/sy
Emulsified Asphalt LMCRS-2	250	gal/ton	0.4	gal/sy
Flush Coat	245	gal/ton	0.11	gal/sy
Water			42	gal/cy GB
			51	gal/cy UTBC
			45	gal/cy Borrow/Embank

Choose Either Ton or Vol
Manually Input

Water			
Material	Vol cy	gal	1,000 gal
GB	16210	680820	680.8
UTBC	9062	462162	462.2
Borrow	19156	862020	862.0
Embankment	0	0	0.0
TOTAL			2006

Oil									
Roadway	Prime Coat		Tack Coat			LMCRS-2		Flush Coat	
	Area sy	Tons	# of apps	Area sy	Tons	Area sy	Tons	Area sy	Tons
NB	38378	76.8	0	29379	0.0				
			0						
			0						
			0			0	0.0	0	0.0
			0			0	0.0	0	0.0
TOTALS		77			0		0		0

Pavements

Roadway	Length	Top Width	Side Slope	GB				UTBC				HMA			SMA		Asphalt Cement	Chip Seal	4" LCBC		PCCP		Mill - ___"	
				Depth	Width	Vol	Tons	Depth	Width	Vol	Tons	Depth	Width	Tons	Depth	Tons			Width	Area	Depth	Area	Depth	Area
Full Depth Work ***(1 Side)****:*	ft	ft		in	ft	cy		in	ft	cy		in	ft		in		Tons	sy	ft	sy	in	sy	in	sy
NB	15833	14	1/6	12	27.6	16209	29104	8.5	21.8	9062	16637	9.5	16.7	15909	1.5	2064								
Mill/Overlay Work:																								
TOTALS						16210	29104			9062	16637			15909		2065	0	0		0		0		0

Earthwork

Roadway	Roadway Excavation				Borrow					Granular Backfill Borrow				
	Length	Depth	Width	Vol	Length	Depth	Width	Vol	Tons	Length	Depth	Width	Vol	Tons
	ft	in	ft	cy	ft	in	ft	cy		ft	in	ft	cy	
NB					15833	28	14	19156	34395				0	0
TOTALS				0				19156	34395				0	0

Cross Section	Lane Width	Saw cut into shldr	total
Climbing Lane NB	12	2	14

Roadway and Drainage - Climbing Lane (MP 34 to 37)

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Item #	Item	Quantity	Price	Units	Cost	Remarks
Roadway and Drainage						
012850010	Mobilization	1	$450,000.00	Lump	$450,000	10% of construction
013150010	Public Information Services	1	$0.00	Lump	$0	
015540005	Traffic Control	1	$225,000.00	Lump	$225,000	5% of construction
01557001*	Maintenance of Traffic	0	$0.00	Lump	$0	
015720010	Dust Control & Watering	2006	$25.00	1000 gal	$50,150	
017210020	Survey	1	$50,000.00	Lump	$50,000	1% of construction
020560005	Borrow (Plan Quantity)	19156	$15.00	Cu yd	$287,340	
020560010	Borrow	34395	$8.00	Ton	$275,160	
020560015	Granular Borrow (Plan Quantity)	16210	$17.00	Cu yd	$275,570	
020560025	Granular Backfill Borrow (Plan Quantity)	0	$35.19	Cu yd	$0	
020560030	Granular Backfill Borrow	0	$10.00	Ton	$0	
022210015	Remove Bridge	0	$22,594.54	each	$0	
002210080	Remove Fence	0	$1.08	ft	$0	
022210095	Remove Pipe Culvert	0	$20.00	ft	$0	
023160020	Roadway Excavation (Plan Quantity)	0	$12.00	Cu yd	$0	
023310020	Clearing and Grubbing	0	$2,400.00	Acre	$0	
023730010	Loose Riprap	0	$90.00	Cu yd	$0	
027210070	Untreated Base Course 3/4 inch or 1 inch Max	16637	$23.50	Ton	$390,970	
027410060	HMA - 3/4 Inch	15909	$110.00	Ton	$1,749,990	
027480010	Liquid Asphalt MC-70 or MC-250	77	$1,000.00	Ton	$77,000	
027480030	Emulsified Asphalt SS-1	0	$250.00	Ton	$0	
027520020	Portland Cement Concrete Pavement 9 inch Thick	0	$27.82	Sq yd	$0	
027710025	Concrete Curb and Gutter Type B1	0	$14.00	ft	$0	
027760010	Concrete Sidewalk	0	$20.00	Sq yd	$0	
027850030	Chip Seal Coat, Type C	0	$1.00	Sq yd	$0	
027850060	Emulsified Asphalt LMCRS-2	0	$350.00	Ton	$0	
02785008*	Flush Coat	0	$250.00	Ton	$0	
02744000*	SMA - 1/2 inch	2065	$120.00	Ton	$247,800	
027860020	Asphalt Cement PG 64-34	0	$200.00	Ton	$0	
028220010	Right of Way Fence, Type G (Deer Fence)	0	$4.00	ft	$0	
029120050	Strip, Stockpile, and Spread Topsoil	0	$1.00	Sq yd	$0	Assumed LxW
029220010	Drill Seed	0	$470.00	Acre	$0	Assumed LxW
029610050	Rotomilling	0	$4.50	Sq yd	$0	
026100032	24 Inch Pipe Culvert, Class C	0	$24.79	ft	$0	
026100034	24 Inch Pipe Culvert, Class C	0	$36.14	ft	$0	
026100038	36 Inch Pipe Culvert, Class C	0	$65.72	ft	$0	
026100042	48 Inch Pipe Culvert, Class C	0	$98.02	ft	$0	
029620010	In-Place Cold Recycled Asphaltic Base	0	$2.60	Sq yd	$0	
Roadway and Drainage Subtotal					**$4,078,980**	Back to Main

Traffic, Safety & ITS - Climbing Lane (MP 34 to 37)

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	Item	Quantity	Price	Units	Cost	Remarks
Traffic, Safety & ITS						
Traffic						
	W-Beam Guardrail	7920	$22.00	ft	$174,240	
	Crash Cushion Type G	0	$3,000.00	Each	$0	
	Concrete Barrier (New Jersey Shape)	0	$50.00	ft	$0	
	Pavement Marking Paint	0	$27.00	gal	$0	
	Pavement Message Paint	0	$0.00	Each	$0	
	Signs	0	$120,000.00	Lump	$0	
Signals						
Lighting						
	Highway Lighting System	0	$150,000.00	Each	$0	
Traffic and Safety Subtotal					**$174,240**	
ITS						
	Multiduct Conduit	0	$50,000.00	Lump	$0	
ITS Subtotal					**$0**	Back to MAIN

Structures - Climbing Lane (MP 34 to 37)

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Item #	Item	Quantity	Price	Units	Cost	Remarks
Structures						
Bridges						
	Structure Maintenance	0	$100,000.00		$0	
	Widen or Replace Ash Creek Culvert	0	$200,000.00		$0	
	Widen or Replace Dry Creek Culvert	0	$200,000.00		$0	
Walls						
	Retaining Wall	0	$50.00	Sq ft	$0	Assumed LxH (wall area)
				ft		
Hydraulics						
	Extend Box Culvert	0	$200.00	ft	$0	
	New Box Culvert					
	Scour Mitigation					
Geotech						
	Geotech Report	0	$25,000.00	Lump	$0	
	Drilling	0	$25,000.00	Lump	$0	
Structures Subtotal					**$0**	

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Environmental and Landscaping - Climbing Lane (MP 34 to 37)

Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Environmental & Landscaping						
Environmental						
	Wetland Mitigation	0	$50,000.00	Lump	$0	
	Noise Wall	0	$1,000.00	ft	$0	
Temporary Erosion Control						
	Silt Fence	0	$20.00	Ft	$0	
	Erosion Control Supervisor	0	$20,000.00	Lump	$0	
	Check Dams	0	$250.00	Each	$0	
Landscaping						
	Contractor Furnished Topsoil			sq ft		
	Strip, Stockpile, Spread Topsoil			sq ft		
	Wood Fiber Mulch			acre		
	Broadcast Seed			acre		
	Drill Seed			acre		
Environmental Mitigation Subtotal					$0	Back to MAIN

Miscellaneous - Climbing Lane (MP 34 to 37)

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Item #	Item	Quantity	Price	Units	Cost	Remarks
Utilities						
	Relocate Water Line	0	$500.00	Lump	$0	
	Relocate Gas Line	0	$50,000.00	Lump	$0	
	Relocate Power Line			Lump		
	Relocate Fiber Optic			Lump		
	Relocate Phone			Lump		
	S.U.E	0	$20,000.00	Lump	$0	Assume $1.00 per foot per utility
Utilities Subtotal					**$0**	
Right-of-way						
	Urban/Suburban Residential	0	$5.00	sq ft	$0	Wasatch Front/Cache Valley/Cedar City/ Saint George areas
	Urban/Suburban Commercial	0	$15.00	sq ft	$0	Wasatch Front/Cache Valley/Cedar City/ Saint George areas
	non-Urban/Suburban Residential	0	$5.00	sq ft	$0	
	non-Urban/Suburban Commercial	0	$15.00	sq ft	$0	
	non-Urban/Suburban Farm	0	$1.00	sq ft	$0	
Right-of-Way Subtotal					**$0**	
Incentives						
	HMA Properties	0	$2.00	ton	$0	Max $2.31per ton of HMA
	Smoothness	5%	$1,749,990.00	lump	$87,500	% of HMA cost
	OGSC Properties	0	$1.75	ton	$0	Max $1.83 per ton of OGSC
	Lane Rental Incentive	0	$10,000.00	Lump	$0	
	Early Completion	1	$150,000.00	Lump	$150,000	
Incentives Subtotal					**$237,500**	
						Back to MAIN

Roadway / Pavement Summary (Activities 54C, 58C)

Project Design Criteria, as developed in the I-15 Washington County Corridor Study, is located at the end of the appendix. The following is a summary of the deficiencies located on the project.

Horizontal Alignment

The minimum horizontal curve radius for an 80 mph design speed is 3050 ft. I-15 was originally designed with a 65 mph design speed. With the increase in the speed limit several horizontal curves have become deficient. A summary of the deficient horizontal alignments and superelevations can be seen in the table below.

Deficient Horizontal Alignment

Direction	MP	Existing Radius (feet)	Existing Superelevation (e)	Notes
NB & SB	34.75	2864.90	4.9	65 mph design speed

The Horizontal Alignment was not addressed in this project. This deficiency was addressed in the Safety Improvements project as identified in the I-15 Washington County Corridor Study.

Vertical Alignment

Vertical Alignment deficiencies are based on sag or crest K-values. The minimum sag K-value is 231 for an 80 mph design speed and the minimum crest K-value is 384 for an 80 mph design speed. Using the as-built drawings for I-15, the vertical alignment deficiencies were determined and are summarized in the table below.

Deficient Vertical Alignment

Direction	MP	K	Notes	Type
SB	34.43	86.4	45 mph design speed	SAG
NB	34.43	86.43	45 mph design speed	SAG
SB	36.06	203.8	65 mph design speed	CREST
NB	36.06	203.83	65 mph design speed	CREST

Since none of the deficient vertical alignments were associated with an accident cluster, none of the deficient Vertical Alignments were recommended to be realigned.

Stopping Sight Distance

The design stopping sight distance for the project is 910 ft for an 80 mph design speed. The table below summarizes the locations with deficient sight distance.

Deficient Stopping Sight Distance

Direction	From	To	Notes
SB	34.8	35	SB vegetation blocking view

The deficient stopping sight distance was not addressed in this project. This deficiency was addressed in the Safety Improvements project as identified in the I-15 Washington County Corridor Study.

Clear Zone

The minimum clear zone for the project is 30 to 34 ft. Locations denoted in the tables below are deficient due to steep sideslopes or obstacles in the clear zone.

Deficient Clear Zone

Direction	From MP	To MP	Notes
Median	34.50	35.40	Steep sideslopes
SB	35.60	36.50	Steep sideslopes
Median	35.60	36.50	Trees located in clear zone
NB	36.90	37.10	Steep sideslopes

Culverts in Clear zone

Direction	MP	Notes
SB	35.520	Culvert in clear zone
NB	36.506	Culvert in clear zone

The deficient clear zone was not addressed in this project. This deficiency was addressed in the Pavement Rehabilitation (MP 34 to 42) project as identified in the I-15 Washington County Corridor Study.

Guardrail

Deficient guardrail was defined as guardrail that did not meet the height standard of 32 inches, guardrail with Texas turndown end sections, and guardrail/barrier with insufficient length of need. As a general note, no barrier offset was found at any guardrail or barrier location on the project. A summary of the deficient guardrail and length of need is located in the tables below.

Deficient Guardrail

Direction	MP	Notes
SB	36.25	short guardrail

Insufficient length of need

Direction	MP	Notes
NB	34.80	Insufficient length of need
SB	35.40	Insufficient length of need

The deficient guardrail was not addressed in this project. This deficiency was addressed in the Pavement Rehabilitation (MP 34 to 42) project as identified in the I-15 Washington County Corridor Study.

Pavement Design

A preliminary pavement section has been provided for cost estimate purposes. To add a climbing lane will require new pavement. The following pavement section was used in the cost estimate:

- 12 inch granular borrow
- 8.5 inch untreated base course
- 9.5 inch hot mix asphalt
- 1.5 inch stone matrix asphalt

Traffic and Safety Summary (Activity 64C)

An Operational safety report will need to be completed by UDOT traffic and safety. In addition to their report, a project specific analysis of corridor safety was completed by identifying locations with a project based high number of severe accidents (accidents level 3 or higher). By geographically analyzing the accident data from 2002 to 2005, accident clusters were identified by determining grouping location of severe accidents. Some of the accident clusters were also verified by comments from UDOT maintenance and public comment.

Accident Clusters

MP	Description
34.2	Speed, caused by SB vehicles coming down 6% grade and speed differential going up the 6% NB grade.
36.2	Steep grades and speed differential

This project addresses the speed differential issues associated with the steep grades of the Black Ridge. A traffic analysis of this section of the corridor has shown a need for a climbing lane in 2040 due to the delay and congestion created by the speed differential (for a full report see the I-15 Corridor Study). The climbing lane however has been recommended to be constructed at a sooner date due to the safety problems noted on the corridor. By providing a climbing lane the speed differential problem will be reduced, thus reducing the accident rate and severity.

Structures Summary (Activity 62C)

No structural work to be done on this project.

Environmental Summary (Activity 52C)

A categorical exclusion is the expected level of environmental documentation for the project.

Cultural and Paleontological

A significant number of cultural sites can be expected in this area. A few archeological studies have been performed on the parts of the project area. There is one ineligible documented cultural site from those surveys of the project. No impact to this site is expected. A cultural inventory within the project area will be needed to determine the extent of cultural sites in the area.

Environmental
Bald Eagle - Wintering habitat only. No known winter roost sites or nest sites within 0.5-mile of I-15 corridor.

California Condor - Possible fly over. Possible habitat locations are the cliffs of Black Ridge, Kolob Terrace, and Zion National Park. Condors have not been seen in this area; they are found southeast of St. George in the Vermillion Cliffs. It is possible that future pairs could nest in the cliffs found along the northern section of I-15 in Washington County.

Mexican Spotted Owl - Habitat found in the cliffs at northern end of I-15 corridor in Zion National Park Kolob District. Federally designated critical habitat is within 0.5 mile east of the corridor (MP- 30-42). 2 years of survey with 4 surveys each year are required for spotted owls if suitable habitat is within 0.5 air miles of the construction area. A detail survey will only be required if suitable habitat is found in the initial survey. Survey season March 1 – August 31. Breeding season for the owls is March 15 – August 31.

Wildlife
Critical deer winter range exists throughout the project. The wildlife connectivity issues in this area are rated as "critical" for connectivity linkage zone #4-11 (se UDOT publication "Wildlife Connectivity across Utah's Highways" June 2006) for deer, raptors, and cougar. An adequate number of crossings already exist if they are maintained to serve as crossings. The project is currently fenced with livestock fencing in poor condition. This fence needs to be replaced with the current standard wildlife fence.

This project does not address wildlife issues, but deer fence is recommended in a phase III project as identified in the I-15 Washington County Corridor Study.

Right of Way Summary (Activity 56C)

No right-of-way impacts expected.

Utility and Railroad Summary (Activity 68C)

No utility or railroad conflicts identified.

ITS Summary (Activity 66C)

No ITS improvements are to be completed with this project. Consideration should be given to adding a VMS and RWIS system. This is needed to warn truck and other traffic of poor weather conditions on the Black Ridge.

Public Involvement Summary (Activity 60C)

The public involvement plan is to coordinate with local municipalities, Port of Entry, Truckers Association, Tourism Bureau, and local media, on project construction schedule and traffic impacts.

PROJECT DESIGN CRITERIA

I. PROJECT DESCRIPTION

Date: January 17, 2008

Project Name	**I-15 Corridor Study, Washington County MP 0 to 42**		
Project Number	**S-R499(48)**	PIN	**6361**

Describe the scope of the project: A corridor study for I-15 from the Arizona State Line (MP 0) in Washington County to the New Harmony Interchange (MP 42) in Washington County. The purpose of the project is to identify corridor needs and constraints, provide solutions, prioritize and develop a schedule for implementing those solutions, and provide concept reports for immediate projects. Projects identified will be included on the STIP. The time period for the corridor study includes analysis for the current year 2007 and the next 30 years (2040).

II. DESIGN STANDARDS BY ROADWAY (complete for each roadway on your project)

ROADWAY: I-15, MP 0.0 to MP 11.5

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**70 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	70 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft								
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504-505 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	2040 ft			Mainline					

I-15, MP 0.0 to MP 11.5 (continued)

12 Critical Elements	UDOT Standard			Proposed			Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value		Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Mainline	181	247	Mainline				
Profile Grades	% Min		% Max	% Min		% Max		AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5					
Stopping-Sight Distance	Minimum			Minimum				AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	730 ft		Mainline				
Cross Slope	Minimum							AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%							
Superelevation	Maximum Superelevation (UDOT Standard)							UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%							
Structural Capacity	Design Loading							Reference roadway design MOI, pg 288
	HS20 existing bridges HL-93 new structures							
Vertical Clearance*	Minimum							UDOT Roadway Design MOI p. 64
	16 feet 6 inches							
Bridge Width	Minimum							UDOT Roadway Design MOI p. 63
	Add 2 ft to travel way to each side of bridge							

I-15, MP 0.0 to MP 11.5 (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: I-15, MP 11.5 to MP 42

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**80 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	80 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft				.				
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	3050 ft			Mainline					
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value			AASHTO GB p. 272 & 277
	Mainline	231	384		Mainline					
Profile Grades	% Min		% Max		% Min		% Max			AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5							
Stopping-Sight Distance	Minimum				Minimum					AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	910 ft			Mainline					
Cross Slope	Minimum									AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%									
Superelevation	Maximum Superelevation (UDOT Standard)									UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%									

I-15, MP 11.5 to MP 42

12 Critical Elements	UDOT Standard	Proposed	Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Structural Capacity	Design Loading HS20 existing bridges HL-93 new structures			Reference roadway design MOI, pg 288
Vertical Clearance*	Minimum 16 feet 6 inches			UDOT Roadway Design MOI p. 64
Bridge Width	Minimum Add 2 ft to travel way to each side of bridge			UDOT Roadway Design MOI p. 63

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft (not in roadside table)			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General Off Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General Off Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	40 mph or less 14 ft to 16 ft 50 mph 18 ft to 20 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1 sideslope
Ramp Terminal Sight Distance	25 mph – 155 ft			AASHTO GB p. 828
Ramp Design	UDOT STD DWG DD 6			AASHTO GB p. 825+
Gores	UDOT STD DWG DD 6			AASHTO GB p. 832-837
Ramp Terminals	UDOT STD DWG DD 6			AASHTO GB p. 840-845
Ramp Entrances	UDOT STD DWG DD 6			AASHTO GB p. 845
Acceleration Lanes	AASHTO p. 847, 848			
Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General Off Ramp (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Guardrail Bridge Connection	N/A			
Sideslopes	6:1 in clear zone			UDOT STD DWG DD 4 AASHTO GB p. 326-329
Intersection Sight Distance	UDOT Roadway Design MOI p. 127-128 AASHTO GB p. 650-677			
Shoulder/Travel way (gutter pan)	Gutter pan not included in travelway or shoulder			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General On Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	**See attached**	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General On Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	40 mph or less 14 ft to 16 ft 50 mph 18 ft to 20 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1 sideslope
Ramp Terminal Sight Distance	25 mph – 155 ft			AASHTO GB p. 828
Ramp Design	UDOT STD DWG DD 6			AASHTO GB p. 825+
Gores	UDOT STD DWG DD 6			AASHTO GB p. 832-837
Ramp Terminals	UDOT STD DWG DD 6			AASHTO GB p. 840-845
Ramp Entrances	UDOT STD DWG DD 6			AASHTO GB p. 845
Acceleration Lanes	AASHTO p. 847, 848			
Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General On Ramp (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Guardrail Bridge Connection	N/A			
Sideslopes	6:1 in clear zone			UDOT STD DWG DD 4 AASHTO GB p. 326-329
Intersection Sight Distance	UDOT Roadway Design MOI p. 127-128 AASHTO GB p. 650-677			
Shoulder/Travel way (gutter pan)	Gutter pan not included in travelway or shoulder			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

Prepared by:_____ Phone Number:_____

Verified Only - Region Preconstruction Engineer:_____ Date:_____

Approved by Region Preconstruction Engineer, Consulting Engineer,
or Local Government Engineer:_____ Date:_____

Required Signatures

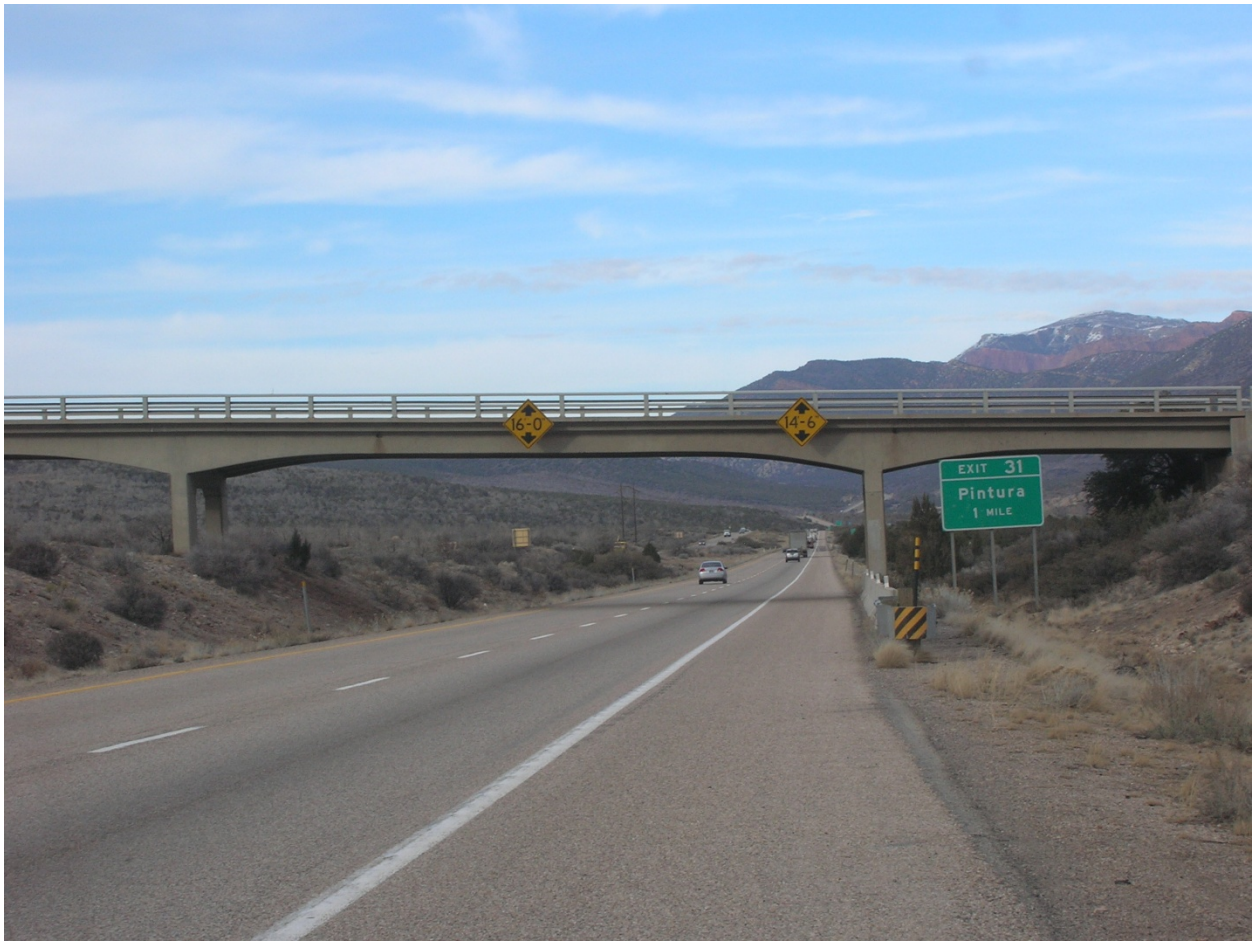
Local government projects require Regional Preconstruction Engineer signature for verification and the Local Government Engineer signature for approval.
Local government projects on State highway system require the Region Preconstruction Engineer signature for approval.
All other projects require Region Preconstruction Engineer signature for approval.

UTAH DEPARTMENT OF TRANSPORTATION
Region 4

CONCEPT REPORT
For

Pavement Rehabilitation (MP 27 to 34)

October 28, 2008



CONCEPT REPORT
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Structure Summary (Activity 62C)
Environmental Summary (Activity 52C)
Right of Way Summary(Activity 56C)
Utility and Railroad Summary (Activity 68C)
ITS Summary (Activity 66C)
Public Involvement Summary (Activity 60C)

CONCEPT REPORT SUMMARY

SECTION 1: General Information

Project Name:	**Pavement Rehabilitation (MP 27 to 34)**		
Project Manager:	**Kim Manwill**	**County:**	**Washington**
Pin Number:		**Begin Mile Post:**	**27.3**
Project Number:		**End Mile Post:**	**34.3**
Route Number:	**15**	**Design Year:**	**2013**
Functional Classification:	**Interstate**	**Design Speed:**	**80 mph**

Describe the Purpose/Need for this Project:

The purpose of the Pavement Rehabilitation (MP 27 to 34) project is to maintain the existing pavement, structures, and roadway to a satisfactory level. Due to the deterioration of the existing pavement major/minor rehabilitation will be needed to bring the existing pavement to a sufficient level. The project elements include increasing the ramp acceleration and deceleration lengths, pavement, maintain adequate vertical clearance, structural maintenance, guardrail improvements, and improve clear zone.

Major Project Risks:

- Oil Cost Escalation- Pavement costs make up the bulk of this projects budget. To mitigate the cost of pavement, a standard 10% contingency has been used.
- Chain-up Location – By not having a clear adequate chain-up area for trucks creates problems, as trucks slide on the Black Ridge during poor weather. To mitigate this till an adequate place is created, proper signing of the existing chain-up area (Snowfield Interchange) is needed.

Project Estimate and Timeline:

Planning Estimate:		**Proposed Construction FY:**	**2013**
Total Project Cost (Current Year):	**$21,389,400**	**Estimated Construction Duration:**	*1 year*
Construction Year Estimate (2011):	**$29,810,000**	**Recommended Commission Approved Amount:**	

Signature Block:

Project Manager **Date**	**Region Preconstruction Engineer** **Date**
Region STIP Workshop Chair **Date**	**Region Director** **Date**
Consultant **Date**	

SECTION 2: Design Information (Executive Summary)

Roadway / Pavement Summary (Activities 54C, 58C)	**Estimated Construction Cost:**	**$18,710,000**

Of the deficiencies identified on this project superelevation, vertical clearance, clear zone, guardrail, and ramp deficiencies will be fixed with this project. The vertical alignments will not be brought to standard, because no accident cluster was associated with any of the deficiencies. The safety issues caused by the deficient grade will be addressed in a Phase III climbing lane project as identified in the I-15 Washington County Corridor Study.

Design exceptions will be needed for the vertical alignments and deficient grade.

No major drainage issues were identified for this project.

The pavement will require major/minor rehabilitation, to bring the pavement to a satisfactory level. The pavement will consist of 2" spot rotomilling, 3" in-place cold recycled asphaltic base, 1.5" hot mix asphalt, and 1.5" stone matrix asphalt.

The capacity analysis for the project showed that no capacity improvements were needed from MP 19-27.

Traffic and Safety Summary (Activity 64C)	**Estimated Construction Cost:**	**$887,000**

All guardrail and crash cushions will be brought to standard. Also all signs need to be replaced and if necessary brought to current standard.

Structures Summary (Activity 62C)	**Estimated Construction Cost:**	**$912,000**

The project structural plan is to perform preventative maintenance to all structures within the project limits. This includes, asphalt surfacing removal, pothole patching, waterproofing the membrane, overlays, sealing the parapet, and joint replacement.

Environmental Summary (Activity 52C)	**Estimated Mitigation Cost:**	**$45,000**

A categorical exclusion is the expected level of environmental documentation of the project.

Several cultural sites have been identified in this area through survey completed within the right-of-way of the project area.

Two threatened and endangered raptor species, the Bald Eagle and the California Condor, have potential habitat within the project area. Currently no known habitat for either species is found within 0.5 miles of the corridor. A survey may be required to confirm that no habitat exists within 0.5 miles of the corridor.

The Mexican Spotted Owl has designated critical habitat within 0.5 mile of the corridor.

The Mexican Spotted Owl will require survey to be preformed 2 years prior to construction. The Mitigation plan would be to discourage the owls from nesting or to avoid construction during the nesting season March through August.

The environmental documentation cost has been included in the PE cost in the cost estimate. The environmental mitigation includes silt fence, erosion control, and check dams.

Right of Way Summary (Activity 56C)	**Estimated Property Cost:**	**$0**
No Right-of-Way impacts or acquisition expected.		

Utility and Railroad Summary (Activity 68C)	**Estimated Relocation Cost:**	**$0**
No utility or railroad conflicts expected.		

ITS Summary (Activity 66C)	**Estimated Construction Cost:**	**$0**
No ITS improvements are to be completed with this project. Consideration should be given to adding a VMS and RWIS system. This is needed to warn truck and other traffic of poor weather conditions on the Black Ridge. No ITS cost was accounted for in this project.		

Public Involvement Summary (Activity 60C)	**Estimated Cost:**	**$15,000**
The public involvement plan is to coordinate with local municipalities, Port of Entry, Truckers Association, Tourism Bureau, and local media, on project construction schedule and traffic impacts.		

Miscellaneous Summary:
The total construction cost includes concept report cost, PE, CE, and a 10% project contingency. See the Concept Estimate following this summary.

CONCEPT REPORT
Appendix A

SECTION 3: Project Log

Complete the Following:

Date Received	Deliverable
	Roadway/Pavement Summary (Activities 54C, 58C)
	Traffic and Safety Summary (Activity 64C)
	Structures Summary (Activity 62C)
	Environmental Summary (Activity 52C)
	Right of Way Summary (Activity 56C)
	Utility and Railroad Summary (Activity 68C)
	ITS Summary (Activity 66C)
	Public Involvement Summary (Activity 60C)

(Update this as major decisions are made regarding the project.)

Date	Decision Made
10/08	Preliminary Concept Report from I-15 Washington County Corridor Study

PIN ----- PROJECT # ----- Pavement Rehabilitation (MP 27 to 34)

Cost Estimate - Concept Level

Approximate Route Reference Post (BEGIN) =	27.287	(END) =	34.324	
Accumulated Mileage (BEGIN) =	27.287	(END) =	34.324	
Project Length =	7.037	miles	37,155 ft	
Current Year =	2008			
Assumed Construction Year =	2013			
Assumed Yearly Inflation for Construction and Utility Items (%/yr) =	7.0%	5 yrs for inflation		For projects 1 Year out use 10%, 2 Years 9%,
Assumed Yearly Inflation for Engineering Services (PE and CE) (%/yr) =	6.0%			
Assumed Yearly Inflation for Urban Residential Right of Way (%/yr) =	6.5%			
Assumed Yearly Inflation for Urban Commercial Right of Way (%/yr) =	4.0%			
Assumed Yearly Inflation for non-Urban Right of Way (%/yr) =	2.0%			
Construction Items Contingency (% of Construction) =	10.0%			10% Rural PB; 15% Urban PB; 20% Non PB
Preliminary Engineering (% of Construction + Incentives) =	8.0%			
Construction Engineering (% of Construction + Incentives) =	10.0%			

Item #					Cost	Remarks
Construction						
	Roadway and Drainage				$13,339,895	
	Traffic and Safety				$632,119	
	Structures				$650,000	
	Environmental Mitigation				$32,000	
	ITS				$0	
				Subtotal	$14,654,014	
			Construction Items Contingency (for minor items not listed)	(10%)	$1,465,401	
				Construction Subtotal	**$16,119,415**	
P.E. Cost				**P.E. Subtotal**	**$1,290,000**	8%
C.E. Cost				**C.E. Subtotal**	**$1,650,000**	10%
Right of Way Urban/Suburban Residential				**Right of Way Subtotal**	$0	
Right of Way Urban Suburban Commercial				**Right of Way Subtotal**	$0	
Right of Way non-Urban/Suburban				**Right of Way Subtotal**	$0	
Utilities				**Utilities Subtotal**	$0	
Incentives				**Incentives Subtotal**	$383,387	
Miscellaneous				**Miscellaneous Subtotal**	**$0**	

Cost Estimate (ePM screen 505)		2008		2013	
Concept Report Cost	0.20%	**$32,000**		**$32,000**	includes cost for T&E
P.E.		**$1,290,000**		**$1,726,000**	
Right of Way		**$0**		**$0**	
Utilities		**$0**		**$0**	
Construction		**$16,119,000**		**$22,608,000**	
C.E.		**$1,650,000**		**$2,208,000**	
Incentives		**$383,000**		**$537,000**	
Contingency	**10%**	**$1,947,400**		**$2,731,000**	
Miscellaneous		**$0**		**$0**	
	TOTAL	**$21,389,400**	**TOTAL**	**$29,810,000**	

PROPOSED COMMISSION REQUEST	**TOTAL**	**$21,389,400**	**TOTAL**	**$29,810,000**

Cost Estimate Summary of Assumptions -Pavement Rehabilitation (MP 27 to 34)

Unit Weights			Application Rates	
Borrow	133	lb/cf		
Gran. Backfill Borrow	133	lb/cf		
Granular Borrow	133	lb/cf		
UTBC	136	lb/cf		
HMA	152	lb/cf		
SMA	149	lb/cf		
Asphalt Cement	6.20%	OGSC		
Prime Coat	250	gal/ton	0.5	gal/sy
Tack Coat	240	gal/ton	0.08	gal/sy
Emulsified Asphalt LMCRS-2	250	gal/ton	0.4	gal/sy
Flush Coat	245	gal/ton	0.11	gal/sy
Water			42	gal/cy GB
			51	gal/cy UTBC
			45	gal/cy Borrow/Embank

Choose Either Ton or Vol
Manually Input

Water			
Material	Vol	gal	1,000
	cy		gal
GB	0	0	0.0
UTBC	0	0	0.0
Borrow	13038	586710	586.7
Embankment	6000	270000	270.0
TOTAL			**857**

Oil								
Roadway	Prime Coat		Tack Coat			LMCRS-2		Flush Coat	
	Area	Tons	# of apps	Area	Tons	Area	Tons	Area	Tons
	sy			sy		sy		sy	
Toquerville Ramps	2771	5.5	0						
Browse Ramps	10491	21.0	0						
Pintura Ramps	5345	10.7	0						
Snowfield Ramps	9545	19.1	0						
			0						
TOTALS		**57**			**0**		**0**		**0**

Pavements

Roadway	Length	Top Width	Side Slope	GB				UTBC				HMA			SMA		Asphalt Cement	Chip Seal	4" LCBC		CIPR		Mill - ___"	
				Depth	Width	Vol	Tons	Depth	Width	Vol	Tons	Depth	Width	Tons	Depth	Tons			Width	Area	Depth	Area	Depth	Area
*Full Depth Work **(1 Side)**:*	ft	ft		in	ft	cy		in	ft	cy		in	ft		in		Tons	sy	ft	sy	in	sy	in	sy
Toquerville Ramps	1400	10	1/6	12	23.6	1226	2201	8.5	17.8	654	1201	9.5	12.7	1070	1.5	130								
Browse Ramps	5300	10	1/6	12	23.6	4641	8332	8.5	17.8	2477	4548	9.5	12.7	4050	1.5	494								
Pintura Ramps	2700	10	1/6	12	23.6	2364	4245	8.5	17.8	1262	2317	9.5	12.7	2063	1.5	251								
Snowfield Ramps	2700	24	1/6	12	37.6	3764	6759	8.5	31.8	2254	4138	9.5	26.7	4337	1.5	603								
Mill/Overlay Work:																								
NB	37155	38	1									1.5	38.3	13524	1.5	13148					3	156877		
SB	37155	38	1									1.5	38.3	13524	1.5	13148					3	156877		
Toquerville Ramps	6100	24	1									1.5	24.3	1409	1.5	1363							2	16267
Browse Ramps	4350	24	1									1.5	24.3	1005	1.5	972							2	11600
Pintura Ramps	2800	24	1									1.5	24.3	647	1.5	626							2	7467
Snowfield Ramps	3350	25	1									1.5	24.0	806	1.5	780							2	9306
Browse	800	76	1																				2	6756
TOTALS						**0**	**0**			**0**	**0**			**42434**		**31517**	**0**	**0**		**0**		**313754**		**51395**

Earthwork

Roadway	Roadway Excavation				Borrow					Granular Backfill Borrow				
	Length	Depth	Width	Vol	Length	Depth	Width	Vol	Tons	Length	Depth	Width	Vol	Tons
	ft	in	ft	cy	ft	in	ft	cy		ft	in	ft	cy	
Toquerville Interchange Ramps	1400	32	10	1361										
Browse Ramps	5300	32	10	5153										
Pintura Ramps	2700	32	10	2625										
Snowfield Ramps	2700	32	10	2625										
NB					10560	20	10	6519	11704					
SB					10560	20	10	6519	11704					
TOTALS				**11764**				**13038**	**23408**				**0**	**0**

Cross Section	inside shldr	lane width	outside shldr	total
NB& SB	4	24	10	38
Ramps	4	14	6	24

Fill **Assumptions**
width 10 ft additional to bring to current standard of 30 ft clear zone at 6:1
depth 20 inch average

Roadway and Drainage - Pavement Rehabilitation (MP 27 to 34)

Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Roadway and Drainage						
012850010	Mobilization	1	$1,500,000.00	Lump	$1,500,000	10% of construction
013150010	Public Information Services	1	$15,000.00	Lump	$15,000	
015540005	Traffic Control	1	$750,000.00	Lump	$750,000	5% of construction
01557001*	Maintenance of Traffic	0	$0.00	Lump	$0	
015720010	Dust Control & Watering	857	$25.00	1000 gal	$21,425	
017210020	Survey	1	$150,000.00	Lump	$150,000	1% of construction
020560005	Borrow (Plan Quantity)	13038	$15.00	Cu yd	$195,570	
020560015	Granular Borrow (Plan Quantity)	0	$17.00	Cu yd	$0	
020560025	Granular Backfill Borrow (Plan Quantity)	0	$35.19	Cu yd	$0	
020560030	Granular Backfill Borrow	0	$10.00	Ton	$0	
022210015	Remove Bridge	0	$22,594.54	each	$0	
002210080	Remove Fence	0	$1.08	ft	$0	
022210095	Remove Pipe Culvert	0	$20.00	ft	$0	
023160020	Roadway Excavation (Plan Quantity)	11764	$12.00	Cu yd	$141,168	
023310020	Clearing and Grubbing	0	$2,400.00	Acre	$0	
023730010	Loose Riprap	0	$90.00	Cu yd	$0	
027210070	Untreated Base Course 3/4 inch or 1 inch Max	0	$23.50	Ton	$0	
027410060	HMA - 3/4 Inch	42434	$110.00	Ton	$4,667,740	
027480010	Liquid Asphalt MC-70 or MC-250	57	$1,000.00	Ton	$57,000	
027480030	Emulsified Asphalt SS-1	0	$250.00	Ton	$0	
027520020	Portland Cement Concrete Pavement 9 inch Thick	0	$27.82	Sq yd	$0	
027710025	Concrete Curb and Gutter Type B1	0	$14.00	ft	$0	
027760010	Concrete Sidewalk	0	$20.00	Sq yd	$0	
027850030	Chip Seal Coat, Type C	0	$1.00	Sq yd	$0	
027850060	Emulsified Asphalt LMCRS-2	0	$350.00	Ton	$0	
02785008*	Flush Coat	0	$250.00	Ton	$0	
02744000*	SMA - 1/2 inch	31517	$120.00	Ton	$3,782,040	
027860020	Asphalt Cement PG 64-34	0	$200.00	Ton	$0	
028220010	Right of Way Fence, Type G (Deer Fence)	0	$4.00	ft	$0	
029120050	Strip, Stockpile, and Spread Topsoil	247700	$1.00	Sq yd	$247,700	Assumed LxW
029220010	Drill Seed	51	$470.00	Acre	$23,970	Assumed LxW
029610050	Rotomilling	51395	$4.50	Sq yd	$231,278	
026100032	24 Inch Pipe Culvert, Class C	0	$24.79	ft	$0	
026100034	24 Inch Pipe Culvert, Class C	0	$36.14	ft	$0	
026100038	36 Inch Pipe Culvert, Class C	0	$65.72	ft	$0	
026100042	48 Inch Pipe Culvert, Class C	0	$98.02	ft	$0	
029620010	In-Place Cold Recycled Asphaltic Base	313754	$2.60	Sq yd	$815,760	
	Solventless Emulsion	1235	$600.00	Ton	$741,244	
Roadway and Drainage Subtotal					**$13,339,895**	Back to Main

Traffic, Safety & ITS - Pavement Rehabilitation (MP 27 to 34)

Back to MAIN

	Item	Quantity	Price	Units	Cost	Remarks
Traffic, Safety & ITS						
Traffic						
	W-Beam Guardrail	18000	$22.00	ft	$396,000	
	Crash Cushion Type G	32	$3,000.00	Each	$96,000	
	Concrete Barrier (New Jersey Shape)	0	$50.00	ft	$0	
	Pavement Marking Paint	200398	$0.30	ft	$60,119	
	Pavement Message Paint	0	$0.00	Each	$0	
	Signs	1	$80,000.00	Lump	$80,000	
Signals						
Lighting						
	Highway Lighting System	0	$150,000.00	Each	$0	
Traffic and Safety Subtotal					**$632,119**	
ITS						
	Multiduct Conduit	0	$50,000.00	Lump	$0	
ITS Subtotal					**$0**	Back to MAIN

Structures - Pavement Rehabilitation (MP 27 to 34)

Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Structures						
Bridges						
	Structure Maintenance	6	$100,000.00		$600,000	$100,000 per structure
Walls						
	Retaining Wall	0	$50.00	Sq ft	$0	Assumed LxH (wall area)
				ft		
Hydraulics						
	Extend Box Culvert	0	$200.00	ft	$0	
	New Box Culvert					
	Scour Mitigation					
Geotech						
	Geotech Report	1	$25,000.00	Lump	$25,000	
	Drilling	1	$25,000.00	Lump	$25,000	
Structures Subtotal					**$650,000**	Back to MAIN

Environmental and Landscaping - Pavement Rehabilitation (MP 27 to 34)

Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Environmental & Landscaping						
Environmental						
	Environmental Mitigation	0	$20,000.00	Lump	$0	
	Noise Wall	0	$1,000.00	ft	$0	
Temporary Erosion Control						
	Silt Fence	400	$20.00	Ft	$8,000	
	Erosion Control Supervisor	1	$20,000.00	Lump	$20,000	
	Check Dams	16	$250.00	Each	$4,000	
Landscaping						
	Contractor Furnished Topsoil			sq ft		
	Strip, Stockpile, Spread Topsoil			sq ft		
	Wood Fiber Mulch			acre		
	Broadcast Seed			acre		
	Drill Seed			acre		
Environmental Mitigation Subtotal					$32,000	

Back to MAIN

Miscellaneous - Pavement Rehabilitation (MP 27 to 34)

Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Utilities						
	Relocate Water Line	0	$500.00	Lump	$0	
	Relocate Gas Line	0	$50,000.00	Lump	$0	
	Relocate Power Line			Lump		
	Relocate Fiber Optic			Lump		
	Relocate Phone			Lump		
	S.U.E	0	$20,000.00	Lump	$0	Assume $1.00 per foot per utility
Utilities Subtotal					**$0**	
Right-of-way						
	Urban/Suburban Residential	0	$5.00	sq ft	$0	Wasatch Front/Cache Valley/Cedar City/ Saint George areas
	Urban/Suburban Commercial	0	$15.00	sq ft	$0	Wasatch Front/Cache Valley/Cedar City/ Saint George areas
	non-Urban/Suburban Residential	0	$5.00	sq ft	$0	
	non-Urban/Suburban Commercial	0	$15.00	sq ft	$0	
	non-Urban/Suburban Farm	0	$1.00	sq ft	$0	
Right-of-Way Subtotal					**$0**	
Incentives						
	HMA Properties	0	$2.00	ton	$0	Max $2.31per ton of HMA
	Smoothness	5%	$4,667,740.00	lump	$233,387	% of HMA cost
	OGSC Properties	0	$1.75	ton	$0	Max $1.83 per ton of OGSC
	Lane Rental Incentive	0	$10,000.00	Lump	$0	
	Early Completion	1	$150,000.00	Lump	$150,000	
Incentives Subtotal					**$383,387**	
						Back to MAIN

Roadway / Pavement Summary (Activities 54C, 58C)

Project Design Criteria, as developed in the I-15 Washington County Corridor Study, is located at the end of the appendix. The following is a summary of the deficiencies located on the project.

Vertical Alignment

Vertical Alignment deficiencies are based on sag or crest K-values. The minimum sag K-value is 231 for an 80 mph design speed and the minimum crest K-value is 384 for an 80 mph design speed. Using the as-built drawings for I-15, the vertical alignment deficiencies were determined and are summarized in the table below.

Deficient Vertical Alignment

Direction	MP	K	Notes	Type
NB	27.64	267.9	65 mph design speed	CREST
NB	28.60	206.2	65 mph design speed	CREST
SB	29.63	173.1	65 mph design speed	SAG
SB	30.07	138.0	55 mph design speed	CREST
SB	32.10	161.3	65 mph design speed	SAG
NB	32.10	301.2	65 mph design speed	CREST
NB	32.33	233.6	66 mph design speed	CREST
SB	33.53	107.3	50 mph design speed	CREST
NB	33.53	107.32	50 mph design speed	CREST

Since none of the deficient vertical alignments were associated with an accident cluster, none of the deficient Vertical Alignments were recommended to be realigned.

Grades

The maximum allowable grade is based on the terrain and varies from 3-5%, which corresponds to flat, rolling, or mountainous terrain.

Deficient Profile Grades

Direction	From	To	Grade
NB	29.41	29.64	-5.28

This grade exceeds 5% for more than the allowable 500 ft. The grade is not recommended to be altered due to the poor cost benefit ratio. A climbing lane is recommended to aide in the safety of this section of road. It is felt that a climbing lane would have a greater effect on the safety of the corridor than to slightly alter the grade to be just less than 5%. The climbing lane is recommended to be completed in Phase III, as identified in the I-15 Washington County Corridor Study.

Superelevations

The superelevations for the project were originally design for 65 mph. The deficient superelevations will need to be brought to an 80 mph design speed.

Vertical Clearance

The structures at the Browse, Pintura, and Snowfield currently meet AASHTO standards. Caution needs to be exercised with the pavement overlay to not make these structures less than 16'-0". This may include rotomilling or realigning the grade to make the clearance acceptable.

Vertical Clearance

ID	Year	Direction	MP	Clearance	Feature Crossed	Notes
OD 629	1959	NA	30.685	16.2	I-15 Under Browse Interchange	Caution
3D 628	1959	SB	31.833	16.3	I-15 Over CO. RD. Int. X-Rd	Caution
OD 636	1959	NA	33.42	16	I-15 Over CO. RD. Int. X-Rd	Caution

Clear Zone

The minimum clear zone for the project is 30 to 34 ft. Locations denoted in the tables below are deficient due to steep sideslopes or obstacles in the clear zone.

Deficient Clear Zone

Direction	From MP	To MP	Notes
Median	27.60	28.70	Trees located in clear zone
NB	29.42	30.06	Steep sideslopes
SB	30.17	30.44	Trees located in clear zone
Median	31.20	31.60	Trees located in clear zone
NB	33.20	33.60	Steep sideslopes
SB	33.20	33.60	Steep sideslopes

Culverts in Clear zone

Direction	MP	Notes
NB	32.616	Culvert in clear zone

This project will fix all clear zone issues by eliminating the obstacle, correcting the side slope, or protecting the obstacle.

Guardrail

Deficient guardrail was defined as guardrail that did not meet the height standard of 32 inches, guardrail with Texas turndown end sections, and guardrail/barrier with insufficient length of need. As a general note, no barrier offset was found at any guardrail or barrier location on the project. A summary of the deficient guardrail and length of need is located in the table below.

Insufficient length of need

Direction	MP	Notes
SB	27.70	Insufficient length of need
SB	28.90	Insufficient length of need
NB	28.87	Insufficient length of need

SB	31.09	Insufficient length of need
NB	31.09	Insufficient length of need
NB	31.40	Insufficient length of need
NB	33.10	Insufficient length of need

All guardrail on the project will be brought to standard.

Ramp Deficiencies

The tables below summarize the deficient ramp acceleration/deceleration lengths and the ramp terminal/entrances deficiencies.

Deficient Ramp Acceleration/Deceleration Lengths

Direction	MP	Existing Length	Type	Notes
SB Accel	27.30	441.0	Tapered	Deficient acceleration
SB Decel	27.62	218.0	Tapered	Deficient deceleration
NB Decel	30.29	170.0	Tapered	Deficient deceleration
NB Accel	30.39	164.0	Tapered	Deficient acceleration
SB Accel	30.54	226.0	Tapered	Deficient acceleration
SB Decel	30.86	155.0	Tapered	Deficient deceleration
NB Decel	31.73	205.0	Tapered	Deficient deceleration
NB Accel	31.96	344.0	Tapered	Deficient acceleration
SB Accel	31.73	400.0	Tapered	Deficient acceleration
SB Decel	31.96	132.0	Tapered	Deficient deceleration
NB Decel	33.30	103.0	Tapered	Deficient deceleration
NB Accel	33.55	363.0	Tapered	Deficient acceleration
SB Accel	33.30	266.0	Tapered	Deficient acceleration
SB Decel	33.55	150.0	Tapered	Deficient deceleration

Deficient Ramp Terminals/Entrance

Direction	MP	Type	Notes
SB Decel	27.635	Tapered	Deficient terminal 6.5 degrees
NB Accel	30.388	Tapered	Deficient entrance 1.5:1 taper
NB Decel	31.716	Tapered	Deficient terminal 7.3 degrees
SB Decel	31.964	Tapered	Deficient terminal 7.0 degrees
NB Decel	33.277	Tapered	Deficient terminal 8.7 degrees
SB Decel	33.576	Tapered	Deficient terminal 7.5 degrees

All ramp deficiencies on the project will be brought to standard.

Drainage

No major drainage issues were identified with this project.

Pavement Design
The pavement design will need to be provided by the region pavement engineer.

Using pavement data obtained from UDOT Asset Management, a preliminary pavement analysis has been provided. The pavement for the project was tested for its rideability, rutting, cracking, wheel path cracking, and skid resistance. From this data a Deighton Total Infrastructure Management System (dTIMS) Model was created to generate a pavement maintenance and rehabilitation plan. The table below summarizes the pavement condition of the project.

Pavement Condition

Direction	Begin	End	RIDE	RUT	CRCK	WPCK	SKID	dTIMS Model Recommendations
NB	27.3	34.3	64.4	68.3	50.0	90.7	58.1	Minor Rehab 2012 and High Seal 2020
SB	27.3	34.3	61.6	72.6	100.0	94.7	56.1	Minor Rehab 2015 and High Seal 2023

From the pavement condition model a remaining service life (RSL) of the pavement was determined. The RSL is based on rutting, cracking, and wheel path cracking. The RSL is typically assumed to be the lowest of the RSL. From the RSL a proposed pavement strategy was developed.

Remaining Service Life

Direction	Begin	End	RUT RSL	Crack RSL	WCRACK RSL	Proposed Strategy
NB	27.3	34.3	11.6	5.5	22.6	Minor Rehab 2013 and High Seal 2028
SB	27.3	34.3	13.3	30	25.8	Minor Rehab 2013 and High Seal 2028

The 2011 minor rehabilitation will consist of 2” spot rotomilling, 3” in-place cold recycled asphaltic base, 1.5” hot mix asphalt, and 1.5” stone matrix asphalt.

Traffic and Safety Summary (Activity 64C)

An Operational safety report has been completed in a previous concept report for this area (located after the PDC at the end of the appendix). In that report the severity of this segment of roadway was higher than the expected severity. To determine what was the cause of the higher than expected severity, the corridor safety was analyzed by identifying locations with a corridor based high number of severe accidents (accidents level 3 or higher). By geographically analyzing the accident data from 2002 to 2005,

accident clusters were identified by determining grouping location of severe accidents. Some of the accident clusters were also verified by comments from UDOT maintenance and public comment.

Accident Clusters

MP	Description
28.5	Accidents in this area are related to excessive speed and speed differential. Deficient steep Grades and clear zone problems are also located around this location.
31.7	At this interchange, all ramps have substandard acceleration and deceleration lengths. There are also vehicle and wildlife collisions.

The accident cluster at MP 28.5 will be addressed in a Phase III project, as identified in the I-15 Washington County Corridor Study. The project will add a climbing lane to address the speed differential caused by the deficient grade.

The accident cluster at MP 31.7 has vehicle wildlife interaction. The corridor segment currently contains deer fence and uses the interchange as a crossing. It is felt that a breech in the fence could be the contributing factor to the high number of crashes at this location. The Safety Improvements project, identified in the I-15 Washington County Corridor Study, will determine the cause of the vehicle wildlife interaction and repair any damaged fence at this location.

The expected traffic and safety work for the project is to bring guardrail and crash cushions up to standard. Also all signs need to be replaced and if necessary brought to current standard.

Another safety issue is the signing and location of a truck chain-up area. An effective truck chain-up area with proper signing is needed to effectively communicate to truck drivers when to pull over and where. A Phase III project is planned to create a chain-up area. In the mean time signing the current Exit 33 as the chain-up area will help to aid truck drivers to know where to chain-up.

Structures Summary (Activity 62C)

Condition of the structure was obtained from UDOT Structures Inventory and Appraisal Sheets. The structures for this project are:

- 1D-630; Toquerville Interchange
- 3D-630; Toquerville Interchange
- 0D-629; Browse Interchange
- 0D-627; South Ash Creek Structure
- 1D-628; Pintura Interchange
- 3D-628; Pintura Interchange
- 1D-523; Leap Creek Structure
- 3D-635; Leap Creek Structure
- 0D-636; Snowfield Interchange

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 1D 630 Agency ID: 1D 630 SR: 97 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	1D 630
Facility Carried 7:	I-15 (SR-15) NBL	Location 9:	ANDERSON RANCH INTERCHG.
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	0
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	27.470 mi
Feature Intersected 6:	SR-17, INTCHG. X-ROAD		
Latitude 16:	37d 17' 01"	Longitude 17:	113d 18' 23"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 3

Main Span Material/Design 43A/B:

2 Concrete Continuous 04 Tee Beam

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	2 Preformed Fabric
Deck Protection 108C:	None

AGE AND SERVICE

Year Built 27:	1959	Year Reconstructed 106:	-4
Type of Service on 42A:	6 2d level interchg		
Type of Service under 42B:	1 Highway		
Lanes on 28A:	2	Lanes Under 28B:	2
Detour Length 19:	0.0 mi		
ADT 29:	8,328	Truck ADT 109:	36 %
Year of ADT 30:	2002		

GEOMETRIC DATA

Length Max Span 48:	49.9 ft	Structure Length 49:	129.9 ft
Curb/Sdwlk Width L 50A:	0.0 ft	Curb/Sidewalk Width R 50B:	0.0 ft
Width Curb to Curb 51:	38.1 ft	Width Out to Out 52:	44.3 ft
Approach Roadway Width 32: (w/ shoulders)	38.1 ft	Median 33:	1 Open median
Deck Area:	5,758.7 sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft
Minimum Vertical Clearance Over Bridge 53:	328.1 ft		
Minimum Vertical Underclearance Reference 54A:	H Hwy beneath struct		
Minimum Vertical Underclearance 54B:	17.4 ft		
Minimum Lateral Underclearance Reference R 55A:	H Hwy beneath struct		
Minimum Lateral Underclearance R 55:	10.8 ft		
Minimum Lateral Underclearance L 56:	0.0 ft		

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	Right of || bridge
Direction of Traffic 102:	1 1-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNI	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58:	7 Good	Super 59:	7 Good	Sub 60:	7 Good
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:		N N/A (NBI)	

LOAD RATING AND POSTING

Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress
Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	1 Meets Standards	Approach Rail 36C:	1 Meets Standards
Transition 36B:	1 Meets Standards	Approach Rail Ends 36D:	1 Meets Standards
Str. Evaluation 67:	7	Deck Geometry 68:	6 Equal Min Criteria
Underclearance, Vertical and Horizontal 69:	5 Above Tolerable		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 447,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 45,000	Length of Improvement 76:	160.8 ft
Total Cost 96:	$ 738,000	Future ADT 114:	10,119
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	14/3	P Conc Deck/AC Ovly	(SF)	5,242	100 %	5,242	0 %	0	0 %	0	0 %	0	0 %	0
2	110/2	R/Conc Open Girder	(LF)	761	99 %	755	1 %	7	0 %	0	0 %	0	0 %	0
2	205/2	R/Conc Column	(EA)	6	100 %	6	0 %	0	0 %	0	0 %	0	0 %	0
2	215/2	R/Conc Abutment	(LF)	85	100 %	85	0 %	0	0 %	0	0 %	0	0 %	0
2	234/2	R/Conc Cap	(LF)	75	100 %	75	0 %	0	0 %	0	0 %	0	0 %	0
2	313/2	Fixed Bearing	(EA)	12	50 %	6	50 %	6	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	321/3	R/Conc Approach Slab	(SF)	753	100 %	753	0 %	0	0 %	0	0 %	0	0 %	0
2	331/3	Conc Bridge Railing	(LF)	282	100 %	282	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 3D 630 Agency ID: 3D 630 SR: 97 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	3D 630
Facility Carried 7:	I-15 (SR-15) SBL	Location 9:	ANDERSON RANCH INTERCHG.
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	0
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	27.470 mi
Feature Intersected 6:	SR-17, INTCHG. X-ROAD		
Latitude 16:	37d 17' 03"	Longitude 17:	113d 18' 24"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 3

Main Span Material/Design 43A/B:

2 Concrete Continuous 04 Tee Beam

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	2 Preformed Fabric
Deck Protection 108C:	None

AGE AND SERVICE

Year Built 27:	1959	Year Reconstructed 106:	-4
Type of Service on 42A:	6 2d level interchg		
Type of Service under 42B:	1 Highway		
Lanes on 28A:	2	Lanes Under 28B:	2
Detour Length 19:	0.0 mi		
ADT 29:	8,329	Truck ADT 109:	38 %
Year of ADT 30:	2002		

GEOMETRIC DATA

Length Max Span 48:	49.9 ft	Structure Length 49:	129.9 ft
Curb/Sdwlk Width L 50A:	0.0 ft	Curb/Sidewalk Width R 50B:	0.0 ft
Width Curb to Curb 51:	38.1 ft	Width Out to Out 52:	44.3 ft
Approach Roadway Width 32: (w/ shoulders)	38.1 ft	Median 33:	1 Open median
Deck Area:	5,758.7 sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft

Minimum Vertical Clearance Over Bridge 53:	328.1 ft
Minimum Vertical Underclearance Reference 54A:	H Hwy beneath struct
Minimum Vertical Underclearance 54B:	17.4 ft
Minimum Lateral Underclearance Reference R 55A:	H Hwy beneath struct
Minimum Lateral Underclearance R 55:	10.5 ft
Minimum Lateral Underclearance L 56:	0.0 ft

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	Left of || bridge
Direction of Traffic 102:	1 1-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNI	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58:	7 Good	Super 59:	7 Good	Sub 60:	7 Good
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:		N N/A (NBI)	

LOAD RATING AND POSTING

Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress
Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	1 Meets Standards	Approach Rail 36C:	1 Meets Standards
Transition 36B:	1 Meets Standards	Approach Rail Ends 36D:	1 Meets Standards
Str. Evaluation 67:	7	Deck Geometry 68:	6 Equal Min Criteria
Underclearance, Vertical and Horizontal 69:	5 Above Tolerable		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 447,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 45,000	Length of Improvement 76:	160.8 ft
Total Cost 96:	$ 738,000	Future ADT 114:	10,120
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	14/2	P Conc Deck/AC Ovly	(SF)	5,242	0 %	0	100 %	5,242	0 %	0	0 %	0	0 %	0
2	110/1	R/Conc Open Girder	(LF)	761	100 %	761	0 %	0	0 %	0	0 %	0	0 %	0
2	205/1	R/Conc Column	(EA)	6	100 %	6	0 %	0	0 %	0	0 %	0	0 %	0
2	215/2	R/Conc Abutment	(LF)	89	100 %	89	0 %	0	0 %	0	0 %	0	0 %	0
2	234/1	R/Conc Cap	(LF)	75	100 %	75	0 %	0	0 %	0	0 %	0	0 %	0
2	313/1	Fixed Bearing	(EA)	12	50 %	6	50 %	6	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	321/2	R/Conc Approach Slab	(SF)	753	100 %	753	0 %	0	0 %	0	0 %	0	0 %	0
2	331/2	Conc Bridge Railing	(LF)	282	100 %	282	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 0D 629 Agency ID: 0D 629 SR: 90.3 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	0D 629
Facility Carried 7:	CO RD INTER X-ROAD	Location 9:	BROWSE INTERCHANGE
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	4 County Hwy
Level of Service 5C:	0 None of the below	Rte. Number 5D:	00000
Directional Suffix 5E:	0 N/A	% Responsibility :	NA
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	30.713 mi
Feature Intersected 6:	I-15 (SR-15) NBL & SBL		
Latitude 16:	37d 19' 35"	Longitude 17:	113d 17' 09"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 4

Main Span Material/Design 43A/B:

2 Concrete Continuous 04 Tee Beam

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	0 None
Deck Protection 108C:	None

AGE AND SERVICE

Year Built 27: 1959 Year Reconstructed 106: -4

Type of Service on 42A: 6 2d level interchg

Type of Service under 42B: 1 Highway

Lanes on 28A: 2 Lanes Under 28B: 4 Detour Length 19: 123.7 m

ADT 29: 75 Truck ADT 109: % Year of ADT 30: 2002

GEOMETRIC DATA

Length Max Span 48:	77.1 ft	Structure Length 49:	253.0 ft
Curb/Sdwlk Width L 50A:	2.0 ft	Curb/Sidewalk Width R 50B:	2.0 ft
Width Curb to Curb 51:	24.0 ft	Width Out to Out 52:	30.2 ft
Approach Roadway Width 32: (w/ shoulders)	24.0 ft	Median 33:	0 No median
Deck Area:	7,631.6 sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	23.95 ft

Minimum Vertical Clearance Over Bridge 53: 328.1 ft

Minimum Vertical Underclearance Reference 54A: H Hwy beneath struct

Minimum Vertical Underclearance 54B: 16.2 ft

Minimum Lateral Underclearance Reference R 55A: H Hwy beneath struct

Minimum Lateral Underclearance R 55: 11.2 ft

Minimum Lateral Underclearance L 56: 22.0 ft

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	0 Not a STRAHNET hwy	Parallel Structure 101:	No || bridge exists
Direction of Traffic 102:	2 2-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	0 Not on NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	09 Rural Local
Defense Hwy 110:	0 Not a STRAHNET	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58: 7 Good Super 59: 7 Good Sub 60: 7 Good

Culvert 62: N N/A (NBI) Channel/Channel Protection 61: N N/A (NBI)

LOAD RATING AND POSTING

Inventory Rating Method 65: 2 AS Allowable Stress Operating Rating Method 63: 2 AS Allowable Stress

Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	0 Substandard	Approach Rail 36C:	0 Substandard
Transition 36B:	0 Substandard	Approach Rail Ends 36D:	0 Substandard
Str. Evaluation 67:	7	Deck Geometry 68:	6 Equal Min Criteria
Underclearance, Vertical and Horizontal 69:	5 Above Tolerable		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	6 Equal Min Criteria
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 761,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 76,000	Length of Improvement 76:	285.4 ft
Total Cost 96:	$ 1,256,000	Future ADT 114:	91
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38: N NA-no waterway

Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	1 Not Required	Lift Bridge Vertical Clearance 116:	

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	13/2	Unp Conc Deck/AC Ovl	(SF)	6,663	0 %	0	100 %	6,663	0 %	0	0 %	0	0 %	0
2	110/1	R/Conc Open Girder	(LF)	1,001	100 %	1,001	0 %	0	0 %	0	0 %	0	0 %	0
2	205/2	R/Conc Column	(EA)	6	99 %	6	1 %	0	0 %	0	0 %	0	0 %	0
2	215/2	R/Conc Abutment	(LF)	59	100 %	59	0 %	0	0 %	0	0 %	0	0 %	0
2	234/1	R/Conc Cap	(LF)	69	100 %	69	0 %	0	0 %	0	0 %	0	0 %	0
2	303/1	Assembly Joint/Seal	(LF)	56	0 %	0	100 %	56	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	311/1	Moveable Bearing	(EA)	8	85 %	7	15 %	1	0 %	0	0 %	0	0 %	0
2	321/2	R/Conc Approach Slab	(SF)	474	100 %	474	0 %	0	0 %	0	0 %	0	0 %	0
2	334/2	Metal Rail Coated	(LF)	525	100 %	525	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 0D 627 Agency ID: 0D 627 SR: 85 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	0D 627
Facility Carried 7:	I-15 (SR-15)NB&SB	Location 9:	3.6 MI.NO.ANDERSON R.INT.
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	NA
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	31.113 mi
Feature Intersected 6:	SOUTH ASH CREEK		
Latitude 16:	37d 19' 53"	Longitude 17:	113d 16' 54"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 1

Main Span Material/Design 43A/B:

1 Concrete 07 Frame

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	0 None
Deck Protection 108C:	None

AGE AND SERVICE

Year Built 27:	1959	Year Reconstructed 106:	1970
Type of Service on 42A:	1 Highway		
Type of Service under 42B:	5 Waterway		
Lanes on 28A:	4	Lanes Under 28B:	0
Detour Length 19:	19.9 mi		
ADT 29:	17,445	Truck ADT 109:	37 %
Year of ADT 30:	2002		

GEOMETRIC DATA

Length Max Span 48:	49.9 ft	Structure Length 49:	56.1 ft
Curb/Sdwlk Width L 50A:	0.0 ft	Curb/Sidewalk Width R 50B:	0.0 ft
Width Curb to Curb 51:	148.0 ft	Width Out to Out 52:	153.9 ft
Approach Roadway Width 32: (w/ shoulders)	76.1 ft	Median 33:	2 Closed Med w/o Barrier
Deck Area:	8,632.7 sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft

Minimum Vertical Clearance Over Bridge 53:	328.1 ft
Minimum Vertical Underclearance Reference 54A:	N Feature not hwy or RR
Minimum Vertical Underclearance 54B:	0.0 ft
Minimum Lateral Underclearance Reference R 55A:	N Feature not hwy or RR
Minimum Lateral Underclearance R 55:	0.0 ft
Minimum Lateral Underclearance L 56:	0.0 ft

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	No || bridge exists
Direction of Traffic 102:	2 2-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNE	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58:	7 Good	Super 59:	7 Good	Sub 60:	7 Good
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:	7 Minor Damage		

LOAD RATING AND POSTING

Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress
Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	1 Meets Standards	Approach Rail 36C:	1 Meets Standards
Transition 36B:	1 Meets Standards	Approach Rail Ends 36D:	1 Meets Standards
Str. Evaluation 67:	7	Deck Geometry 68:	9 Above Desirable Crit
Underclearance, Vertical and Horizontal 69:	N Not applicable (NBI)		
Waterway Adequacy 71:	8 Equal Desirable	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	3 SC - Unstable		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 729,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 73,000	Length of Improvement 76:	78.7 ft
Total Cost 96:	$ 1,203,000	Future ADT 114:	21,196
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	1 Not Required	Lift Bridge Vertical Clearance 116:	

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	39/2	Unp Conc Slab/AC Ovl	(SF)	8,385	100 %	8,385	0 %	0	0 %	0	0 %	0	0 %	0
2	215/2	R/Conc Abutment	(LF)	144	100 %	144	0 %	0	0 %	0	0 %	0	0 %	0
2	321/2	R/Conc Approach Slab	(SF)	1,518	100 %	1,518	0 %	0	0 %	0	0 %	0	0 %	0
2	331/2	Conc Bridge Railing	(LF)	121	100 %	121	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 1D 628 Agency ID: 1D 628 SR: 96 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	1D 628
Facility Carried 7:	I-15 (SR-15) NBL	Location 9:	PINTURA INTERCHANGE
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	0
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	31.861 mi
Feature Intersected 6:	CO. RD. INT. X-RD		
Latitude 16:	37d 20' 29"	Longitude 17:	113d 16' 30"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 1

Main Span Material/Design 43A/B:

1 Concrete 07 Frame

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	0 None
Deck Protection 108C:	None

AGE AND SERVICE

Year Built 27: 1959 Year Reconstructed 106: -4

Type of Service on 42A: 6 2d level interchg

Type of Service under 42B: 1 Highway

Lanes on 28A: 2 Lanes Under 28B: 2 Detour Length 19: 0.0 mi

ADT 29: 8,768 Truck ADT 109: 36 % Year of ADT 30: 2002

GEOMETRIC DATA

Length Max Span 48:	35.1 ft	Structure Length 49:	40.0 ft
Curb/Sdwlk Width L 50A:	0.0 ft	Curb/Sidewalk Width R 50B:	0.0 ft
Width Curb to Curb 51:	38.1 ft	Width Out to Out 52:	44.0 ft
Approach Roadway Width 32: (w/ shoulders)	38.1 ft	Median 33:	1 Open median
Deck Area:	1,754.5 sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft

Minimum Vertical Clearance Over Bridge 53: 328.1 ft

Minimum Vertical Underclearance Reference 54A: H Hwy beneath struct

Minimum Vertical Underclearance 54B: 16.8 ft

Minimum Lateral Underclearance Reference R 55A: H Hwy beneath struct

Minimum Lateral Underclearance R 55: 3.9 ft

Minimum Lateral Underclearance L 56: 0.0 ft

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	Right of || bridge
Direction of Traffic 102:	1 1-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNI	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58:	8 Very Good	Super 59:	8 Very Good	Sub 60:	7 Good
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:		N N/A (NBI)	

LOAD RATING AND POSTING

Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress
Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	1 Meets Standards	Approach Rail 36C:	1 Meets Standards
Transition 36B:	1 Meets Standards	Approach Rail Ends 36D:	1 Meets Standards
Str. Evaluation 67:	7	Deck Geometry 68:	6 Equal Min Criteria
Underclearance, Vertical and Horizontal 69:	4 Tolerable		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 172,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 17,000	Length of Improvement 76:	62.3 ft
Total Cost 96:	$ 284,000	Future ADT 114:	10,653
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	39/2	Unp Conc Slab/AC Ovl	(SF)	1,711	100 %	1,711	0 %	0	0 %	0	0 %	0	0 %	0
2	215/2	R/Conc Abutment	(LF)	89	95 %	85	5 %	3	0 %	0	0 %	0	0 %	0
2	321/2	R/Conc Approach Slab	(SF)	753	100 %	753	0 %	0	0 %	0	0 %	0	0 %	0
2	331/2	Conc Bridge Railing	(LF)	98	100 %	98	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 3D 628 Agency ID: 3D 628 SR: 96 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	3D 628
Facility Carried 7:	I-15 (SR-15) SBL	Location 9:	PINTURA INTERCHANGE
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	0
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	31.861 mi
Feature Intersected 6:	CO. RD. INT. X-RD		
Latitude 16:	37d 20' 30"	Longitude 17:	113d 16' 31"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 1

Main Span Material/Design 43A/B:

1 Concrete 07 Frame

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	0 None
Deck Protection 108C:	None

AGE AND SERVICE

Year Built 27:	1959	Year Reconstructed 106:	-4		
Type of Service on 42A:	6 2d level interchg				
Type of Service under 42B:	1 Highway				
Lanes on 28A:	2	Lanes Under 28B:	2	Detour Length 19:	0.0 mi
ADT 29:	8,885	Truck ADT 109:	38 %	Year of ADT 30:	2002

GEOMETRIC DATA

Length Max Span 48:	35.1 ft	Structure Length 49:	40.0 ft
Curb/Sdwlk Width L 50A:	0.0 ft	Curb/Sidewalk Width R 50B:	0.0 ft
Width Curb to Curb 51:	38.1 ft	Width Out to Out 52:	44.0 ft
Approach Roadway Width 32: (w/ shoulders)	38.1 ft	Median 33:	1 Open median
Deck Area:	1,754.5 sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft

Minimum Vertical Clearance Over Bridge 53:	328.1 ft
Minimum Vertical Underclearance Reference 54A:	H Hwy beneath struct
Minimum Vertical Underclearance 54B:	16.3 ft
Minimum Lateral Underclearance Reference R 55A:	H Hwy beneath struct
Minimum Lateral Underclearance R 55:	3.9 ft
Minimum Lateral Underclearance L 56:	0.0 ft

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	Left of || bridge
Direction of Traffic 102:	1 1-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNI	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58:	7 Good	Super 59:	7 Good	Sub 60:	7 Good
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:		N N/A (NBI)	

LOAD RATING AND POSTING

Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress
Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	1 Meets Standards	Approach Rail 36C:	1 Meets Standards
Transition 36B:	1 Meets Standards	Approach Rail Ends 36D:	1 Meets Standards
Str. Evaluation 67:	7	Deck Geometry 68:	6 Equal Min Criteria
Underclearance, Vertical and Horizontal 69:	4 Tolerable		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 172,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 17,000	Length of Improvement 76:	62.3 ft
Total Cost 96:	$ 284,000	Future ADT 114:	10,795
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	39/2	Unp Conc Slab/AC Ovl	(SF)	1,711	100 %	1,711	0 %	0	0 %	0	0 %	0	0 %	0
2	215/2	R/Conc Abutment	(LF)	89	7 %	7	93 %	82	0 %	0	0 %	0	0 %	0
2	321/2	R/Conc Approach Slab	(SF)	753	100 %	753	0 %	0	0 %	0	0 %	0	0 %	0
2	331/2	Conc Bridge Railing	(LF)	98	100 %	98	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 1D 523 Agency ID: 1D 523 SR: 96.6 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	1D 523
Facility Carried 7:	I-15 (SR-15) NBL	Location 9:	1.5 MI.NO.PINTURA INTCHG.
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	0
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	33.168 mi
Feature Intersected 6:	LEAP CREEK		
Latitude 16:	37d 21' 29"	Longitude 17:	113d 15' 51"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 1

Main Span Material/Design 43A/B:

1 Concrete 07 Frame

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	0 None
Deck Protection 108C:	None

AGE AND SERVICE

Year Built 27: 1949 Year Reconstructed 106: 1962

Type of Service on 42A: 1 Highway

Type of Service under 42B: 5 Waterway

Lanes on 28A: 2 Lanes Under 28B: 0 Detour Length 19: 0.6 mi

ADT 29: 8,722 Truck ADT 109: 36 % Year of ADT 30: 2002

GEOMETRIC DATA

Length Max Span 48:	40.0 ft	Structure Length 49:	44.9 ft
Curb/Sdwlk Width L 50A:	2.0 ft	Curb/Sidewalk Width R 50B:	2.0 ft
Width Curb to Curb 51:	38.1 ft	Width Out to Out 52:	44.0 ft
Approach Roadway Width 32: (w/ shoulders)	38.1 ft	Median 33:	1 Open median
Deck Area:	1,980.6 sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft

Minimum Vertical Clearance Over Bridge 53:	328.1 ft
Minimum Vertical Underclearance Reference 54A:	N Feature not hwy or RR
Minimum Vertical Underclearance 54B:	0.0 ft
Minimum Lateral Underclearance Reference R 55A:	N Feature not hwy or RR
Minimum Lateral Underclearance R 55:	0.0 ft
Minimum Lateral Underclearance L 56:	0.0 ft

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	Right of || bridge
Direction of Traffic 102:	1 1-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNI	Historical Significance 37:	4 Hist sign not determin
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58: 6 Satisfactory Super 59: 6 Satisfactory Sub 60: 6 Satisfactory

Culvert 62: N N/A (NBI) Channel/Channel Protection 61: 7 Minor Damage

LOAD RATING AND POSTING

Inventory Rating Method 65: 2 AS Allowable Stress Operating Rating Method 63: 2 AS Allowable Stress

Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	1 Meets Standards	Approach Rail 36C:	1 Meets Standards
Transition 36B:	1 Meets Standards	Approach Rail Ends 36D:	1 Meets Standards
Str. Evaluation 67:	6	Deck Geometry 68:	6 Equal Min Criteria
Underclearance, Vertical and Horizontal 69:	N Not applicable (NBI)		
Waterway Adequacy 71:	5 Above Tolerable	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	5 Stable w/in footing		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 186,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 19,000	Length of Improvement 76:	65.6 ft
Total Cost 96:	$ 308,000	Future ADT 114:	10,597
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38: N NA-no waterway

Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	13/3	Unp Conc Deck/AC Ovl	(SF)	1,001	100 %	1,001	0 %	0	0 %	0	0 %	0	0 %	0
2	39/3	Unp Conc Slab/AC Ovl	(SF)	850	100 %	850	0 %	0	0 %	0	0 %	0	0 %	0
2	110/2	R/Conc Open Girder	(LF)	217	73 %	157	26 %	56	2 %	3	0 %	0	0 %	0
2	215/3	R/Conc Abutment	(LF)	89	85 %	75	15 %	13	0 %	0	0 %	0	0 %	0
2	321/3	R/Conc Approach Slab	(SF)	344	100 %	344	0 %	0	0 %	0	0 %	0	0 %	0
2	331/3	Conc Bridge Railing	(LF)	89	100 %	89	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	359/2	Soffit Smart Flag	(EA)	1	0 %	0	100 %	1	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 3D 635 Agency ID: 3D 635 SR: 97.6 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	3D 635
Facility Carried 7:	I-15 (SR-15) SBL	Location 9:	1.5 MI NO PINTURA INTER
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	0
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	33.179 mi
Feature Intersected 6:	LEAP CREEK		
Latitude 16:	37d 21' 31"	Longitude 17:	113d 15' 52"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 1

Main Span Material/Design 43A/B:

1 Concrete 07 Frame

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	0 None
Deck Protection 108C:	None

AGE AND SERVICE

Year Built 27: 1959 Year Reconstructed 106: -4

Type of Service on 42A: 1 Highway

Type of Service under 42B: 5 Waterway

Lanes on 28A: 2 Lanes Under 28B: 0 Detour Length 19: 0.6 mi

ADT 29: 8,723 Truck ADT 109: 38 % Year of ADT 30: 2002

GEOMETRIC DATA

Length Max Span 48:	50.9 ft	Structure Length 49:	58.1 ft
Curb/Sdwlk Width L 50A:	2.0 ft	Curb/Sidewalk Width R 50B:	2.0 ft
Width Curb to Curb 51:	42.0 ft	Width Out to Out 52:	48.2 ft
Approach Roadway Width 32: (w/ shoulders)	38.1 ft	Median 33:	1 Open median
Deck Area:	2,798.6 sq. ft		
Skew 34:	45.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	41.99 ft

Minimum Vertical Clearance Over Bridge 53: 328.1 ft

Minimum Vertical Underclearance Reference 54A: N Feature not hwy or RR

Minimum Vertical Underclearance 54B: 0.0 ft

Minimum Lateral Underclearance Reference R 55A: N Feature not hwy or RR

Minimum Lateral Underclearance R 55: 0.0 ft

Minimum Lateral Underclearance L 56: 0.0 ft

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	Left of || bridge
Direction of Traffic 102:	1 1-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNE	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58: 7 Good Super 59: 7 Good Sub 60: 7 Good

Culvert 62: N N/A (NBI) Channel/Channel Protection 61: 7 Minor Damage

LOAD RATING AND POSTING

Inventory Rating Method 65: 2 AS Allowable Stress Operating Rating Method 63: 2 AS Allowable Stress

Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	1 Meets Standards	Approach Rail 36C:	1 Meets Standards
Transition 36B:	1 Meets Standards	Approach Rail Ends 36D:	1 Meets Standards
Str. Evaluation 67:	7	Deck Geometry 68:	8 Desirable Criteria
Underclearance, Vertical and Horizontal 69:	N Not applicable (NBI)		
Waterway Adequacy 71:	7 Above Minimum	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	5 Stable w/in footing		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 235,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 24,000	Length of Improvement 76:	82.0 ft
Total Cost 96:	$ 389,000	Future ADT 114:	10,598
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38: N NA-no waterway

Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	39/3	Unp Conc Slab/AC Ovl	(SF)	2,702	100 %	2,702	0 %	0	0 %	0	0 %	0	0 %	0
2	215/3	R/Conc Abutment	(LF)	95	100 %	95	0 %	0	0 %	0	0 %	0	0 %	0
2	321/3	R/Conc Approach Slab	(SF)	840	100 %	840	0 %	0	0 %	0	0 %	0	0 %	0
2	331/3	Conc Bridge Railing	(LF)	135	100 %	135	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 0D 636 Agency ID: 0D 636 SR: 90.3 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	0D 636
Facility Carried 7:	CO. RD. INT. X-RD	Location 9:	SNOWFIELD INTERCHANGE
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	4 County Hwy
Level of Service 5C:	0 None of the below	Rte. Number 5D:	00000
Directional Suffix 5E:	0 N/A	% Responsibility :	NA
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	County	Mile Post 11:	0.000 mi
Feature Intersected 6:	I-15 (SR-15) NBL & SBL		
Latitude 16:	37d 21' 42"	Longitude 17:	113d 15' 46"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	0 Not a STRAHNET hwy	Parallel Structure 101:	No || bridge exists
Direction of Traffic 102:	2 2-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	0 Not on NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	09 Rural Local
Defense Hwy 110:	0 Not a STRAHNET	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 4

Main Span Material/Design 43A/B:

2 Concrete Continuous 04 Tee Beam

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	0 None
Deck Protection 108C:	None

CONDITION

Deck 58:	7 Good	Super 59:	7 Good	Sub 60:	7 Good
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:		N N/A (NBI)	

AGE AND SERVICE

Year Built 27:	1959	Year Reconstructed 106:	-4		
Type of Service on 42A:	6 2d level interchg				
Type of Service under 42B:	1 Highway				
Lanes on 28A:	2	Lanes Under 28B:	4	Detour Length 19:	123.7 m
ADT 29:	75	Truck ADT 109:	%	Year of ADT 30:	2002

LOAD RATING AND POSTING

Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress
Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

GEOMETRIC DATA

Length Max Span 48:	73.2 ft	Structure Length 49:	256.9 ft
Curb/Sdwlk Width L 50A:	2.0 ft	Curb/Sidewalk Width R 50B:	2.0 ft
Width Curb to Curb 51:	24.0 ft	Width Out to Out 52:	30.2 ft
Approach Roadway Width 32: (w/ shoulders)	24.0 ft	Median 33:	0 No median
Deck Area:	7,750. sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	23.95 ft
Minimum Vertical Clearance Over Bridge 53:	328.1 ft		
Minimum Vertical Underclearance Reference 54A:	H Hwy beneath struct		
Minimum Vertical Underclearance 54B:	16.0 ft		
Minimum Lateral Underclearance Reference R 55A:	H Hwy beneath struct		
Minimum Lateral Underclearance R 55:	11.5 ft		
Minimum Lateral Underclearance L 56:	25.9 ft		

APPRAISAL

Bridge Rail 36A:	0 Substandard	Approach Rail 36C:	0 Substandard
Transition 36B:	0 Substandard	Approach Rail Ends 36D:	0 Substandard
Str. Evaluation 67:	7	Deck Geometry 68:	6 Equal Min Criteria
Underclearance, Vertical and Horizontal 69:	5 Above Tolerable		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	7 Above Min Criteria
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 770,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 77,000	Length of Improvement 76:	288.7 ft
Total Cost 96:	$ 1,271,000	Future ADT 114:	91
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	1 Not Required	Lift Bridge Vertical Clearance 116:	

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	13/2	Unp Conc Deck/AC Ovl	(SF)	6,598	0 %	0	100 %	6,598	0 %	0	0 %	0	0 %	0
2	110/1	R/Conc Open Girder	(LF)	1,010	90 %	909	10 %	102	0 %	0	0 %	0	0 %	0
2	205/2	R/Conc Column	(EA)	12	100 %	12	0 %	0	0 %	0	0 %	0	0 %	0
2	215/2	R/Conc Abutment	(LF)	59	100 %	59	0 %	0	0 %	0	0 %	0	0 %	0
2	234/1	R/Conc Cap	(LF)	79	100 %	79	0 %	0	0 %	0	0 %	0	0 %	0
2	303/2	Assembly Joint/Seal	(LF)	56	100 %	56	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	311/2	Moveable Bearing	(EA)	16	100 %	16	0 %	0	0 %	0	0 %	0	0 %	0
2	313/1	Fixed Bearing	(EA)	4	100 %	4	0 %	0	0 %	0	0 %	0	0 %	0
2	321/2	R/Conc Approach Slab	(SF)	495	100 %	495	0 %	0	0 %	0	0 %	0	0 %	0
2	359/2	Soffit Smart Flag	(EA)	1	100 %	1	0 %	0	0 %	0	0 %	0	0 %	0
2	362/2	Traf Impact SmFlag	(EA)	2	0 %	0	100 %	2	0 %	0	0 %	0	0 %	0

The structural plan is to perform preventive maintenance treatments to all structures on the project. The work items that will need to be completed as part of the preventative maintenance are:

- Asphalt surfacing removal (structures)
- Pothole patching (deck only)
- Waterproofing membrane (deck and approach slabs)
- 2" hot mix asphalt overlay
- 1" open graded surface course
- Seal parapets
- Joint replacement

Environmental Summary (Activity 52C)

A categorical exclusion is the expected level of environmental documentation of the project.

Cultural and Paleontological

Archeological studies have been performed within the Right-of-way for the project area. There are several documented cultural sites from those surveys of the project, including eligible sites. To see a list of surveys and list of eligible sites, see the environmental section of the I-15 Washington County Corridor Study Technical Reports.

Wetlands

No wetlands impacts are anticipated. Proper erosion control including rip rap, vegetation, and other techniques should be used throughout the project.

Threatened and Endangered Species

Bald Eagle - Wintering habitat only. No known winter roost sites or nest sites within 0.5-mile of I-15 corridor.

California Condor - Possible fly over. Possible habitat locations are the cliffs of Black Ridge, Kolob Terrace, and Zion National Park. Condors have not been seen in this area; they are found southeast of St. George in the Vermillion Cliffs. It is possible that future pairs could nest in the cliffs found along the northern section of I-15 in Washington County.

Mexican Spotted Owl - Habitat found in the cliffs at northern end of I-15 corridor in Zion National Park Kolob District. Federally designated critical habitat is within 0.5 mile east of the corridor (MP- 30-42). 2 years of survey with 4 surveys each year are required for spotted owls if suitable habitat is within 0.5 air miles of the construction area. Survey season March 1 – August 31. Breeding season for the owls is March 15 – August 31.

Wildlife

Critical deer winter range exists throughout the project. An adequate number of crossings already exist if they are maintained to serve as crossings. Currently deer fence exists throughout the project area. It has been recommended to rehabilitate the old deer fence and bring it up to the 8 ft standard. Also wing fence structures, capable of serving as wildlife crossings should angled at 20-30 degrees from the ROW line to the structure. Pole fences should be used between wing fences along the ROW line to exclude livestock form crossing. Natural substrate should be used as surfacing at crossings structure. Gravel or pavement restricts the wildlife use. Earthen deer escape ramps should also be constructed at ¼ to ½ mile intervals

depending on the density of the big game crossings. Generally figure ½ mile spacing with a few extra at key areas.

This project does not address wildlife issues, but deer fence is recommended in a phase III project as identified in the I-15 Washington County Corridor Study.

Right of Way Summary (Activity 56C)

No right-of-way impacts expected.

Utility and Railroad Summary (Activity 68C)

No utility or railroad conflicts identified.

ITS Summary (Activity 66C)

No ITS improvements are to be completed with this project. Consideration should be given to adding a VMS and RWIS system. This is needed to warn truck and other traffic of poor weather conditions on the Black Ridge.

Public Involvement Summary (Activity 60C)

The public involvement plan is to coordinate with local municipalities, Port of Entry, Truckers Association, Tourism Bureau, and local media, on project construction schedule and traffic impacts.

PROJECT DESIGN CRITERIA

I. PROJECT DESCRIPTION

Date: January 17, 2008

Project Name	**I-15 Corridor Study, Washington County MP 0 to 42**		
Project Number	**S-R499(48)**	PIN	**6361**

Describe the scope of the project: A corridor study for I-15 from the Arizona State Line (MP 0) in Washington County to the New Harmony Interchange (MP 42) in Washington County. The purpose of the project is to identify corridor needs and constraints, provide solutions, prioritize and develop a schedule for implementing those solutions, and provide concept reports for immediate projects. Projects identified will be included on the STIP. The time period for the corridor study includes analysis for the current year 2007 and the next 30 years (2040).

II. DESIGN STANDARDS BY ROADWAY (complete for each roadway on your project)

ROADWAY: I-15, MP 0.0 to MP 11.5

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**70 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	70 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft								
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504-505 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	2040 ft			Mainline					

I-15, MP 0.0 to MP 11.5 (continued)

12 Critical Elements	UDOT Standard			Proposed			Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value		Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Mainline	181	247	Mainline				
Profile Grades	% Min		% Max	% Min		% Max		AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5					
Stopping-Sight Distance	Minimum			Minimum				AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	730 ft		Mainline				
Cross Slope	Minimum							AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%							
Superelevation	Maximum Superelevation (UDOT Standard)							UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%							
Structural Capacity	Design Loading							Reference roadway design MOI, pg 288
	HS20 existing bridges HL-93 new structures							
Vertical Clearance*	Minimum							UDOT Roadway Design MOI p. 64
	16 feet 6 inches							
Bridge Width	Minimum							UDOT Roadway Design MOI p. 63
	Add 2 ft to travel way to each side of bridge							

I-15, MP 0.0 to MP 11.5 (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: I-15, MP 11.5 to MP 42

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**80 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	80 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft				.				
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	3050 ft			Mainline					
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value			AASHTO GB p. 272 & 277
	Mainline	231	384		Mainline					
Profile Grades	% Min		% Max		% Min		% Max			AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5							
Stopping-Sight Distance	Minimum				Minimum					AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	910 ft			Mainline					
Cross Slope	Minimum									AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%									
Superelevation	Maximum Superelevation (UDOT Standard)									UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%									

I-15, MP 11.5 to MP 42

12 Critical Elements	UDOT Standard	Proposed	Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Structural Capacity	Design Loading HS20 existing bridges HL-93 new structures			Reference roadway design MOI, pg 288
Vertical Clearance*	Minimum 16 feet 6 inches			UDOT Roadway Design MOI p. 64
Bridge Width	Minimum Add 2 ft to travel way to each side of bridge			UDOT Roadway Design MOI p. 63

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft (not in roadside table)			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General Off Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General Off Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	40 mph or less 14 ft to 16 ft 50 mph 18 ft to 20 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1 sideslope
Ramp Terminal Sight Distance	25 mph – 155 ft			AASHTO GB p. 828
Ramp Design	UDOT STD DWG DD 6			AASHTO GB p. 825+
Gores	UDOT STD DWG DD 6			AASHTO GB p. 832-837
Ramp Terminals	UDOT STD DWG DD 6			AASHTO GB p. 840-845
Ramp Entrances	UDOT STD DWG DD 6			AASHTO GB p. 845
Acceleration Lanes	AASHTO p. 847, 848			
Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General Off Ramp (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Guardrail Bridge Connection	N/A			
Sideslopes	6:1 in clear zone			UDOT STD DWG DD 4 AASHTO GB p. 326-329
Intersection Sight Distance	UDOT Roadway Design MOI p. 127-128 AASHTO GB p. 650-677			
Shoulder/Travel way (gutter pan)	Gutter pan not included in travelway or shoulder			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General On Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	**See attached**	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General On Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	40 mph or less 14 ft to 16 ft 50 mph 18 ft to 20 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1 sideslope
Ramp Terminal Sight Distance	25 mph – 155 ft			AASHTO GB p. 828
Ramp Design	UDOT STD DWG DD 6			AASHTO GB p. 825+
Gores	UDOT STD DWG DD 6			AASHTO GB p. 832-837
Ramp Terminals	UDOT STD DWG DD 6			AASHTO GB p. 840-845
Ramp Entrances	UDOT STD DWG DD 6			AASHTO GB p. 845
Acceleration Lanes	AASHTO p. 847, 848			
Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General On Ramp (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Guardrail Bridge Connection	N/A			
Sideslopes	6:1 in clear zone			UDOT STD DWG DD 4 AASHTO GB p. 326-329
Intersection Sight Distance	UDOT Roadway Design MOI p. 127-128 AASHTO GB p. 650-677			
Shoulder/Travel way (gutter pan)	Gutter pan not included in travelway or shoulder			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

Prepared by:_____ Phone Number:_____

Verified Only - Region Preconstruction Engineer:_____ Date:_____

Approved by Region Preconstruction Engineer, Consulting Engineer,
or Local Government Engineer:_____ Date:_____

Required Signatures

Local government projects require Regional Preconstruction Engineer signature for verification and the Local Government Engineer signature for approval.
Local government projects on State highway system require the Region Preconstruction Engineer signature for approval.
All other projects require Region Preconstruction Engineer signature for approval.

MEMORANDUM **UTAH DEPARTMENT OF TRANSPORTATION**

Date: August 24, 2006

TO: Mike Miles, P.E.
Project Manager, Region 4

FROM: John L. Leonard, P.E.
Traffic & Safety Operations Engineer

John Leonard

Digitally signed by John Leonard
DN: cn=John Leonard, c=US, o=Utah Department of Transportation, ou=Division of Traffic and Safety, email=jleonard@utah.gov
Date: 2006.08.24 22:32:44 -06'00'

SUBJECT: Operational Safety Report #06-102; Project No. F-I15-1(72)27; I-15 MP 27.0 to MP 34; Anderson Jct. to Black Ridge. Concept Development. PIN 5798

We have evaluated the crash history for the subject section of I-15 for the three-year period of 2002 through 2004, with the following results:

RURAL INTERSTATE		ACTUAL				EXPECTED
		2002	2003	2004	TOTAL/AVG	
Number of Crashes		41	45	33	119/39.67	
Crash Rate		1.00	1.02	0.75	0.93	0.92
Severity		1.80	1.87	2.00	1.89	1.82
Single Vehicle Crashes	90.8%				108	

Crash data indicates that the crash rate of this section is about the same as the expected and the severity is slightly higher than the expected. The predominant crash type was the single vehicle accounting for 90.8% or 108 of the total number of crashes. The distribution of these crashes by type, number, and percentage is as follows:

CRASH TYPE	No.	% OF SINGLE VEH. CRASHES
1. Ran Off Road Left	31	28.7
2. Ran Off Road Right	29	26.9
3. Ran Off Road Through Median	15	13.9
4. Hit Other Object	13	12.0
5. Other Non-Collision	8	7.4
6. Fixed Object	7	6.5
7. Wildlife Related	3	2.7
8. Overturned in Roadway	2	1.9
	TOTAL = 108	100.0%

There were no clusters of crashes at any location. Twenty-eight of these crashes (28.9%) were caused by excessive speed; twenty-three (23.7%) were caused by Sleepy drivers, and the rest were caused by other improper driving behavior. There were four fatal crashes within the project boundaries, which resulted in four fatalities; all but one of these crashes were caused by excessive speed, and the last one by a sleepy driver.

We recommend that the following items be considered during design of the project to reduce the number/severity of/or the potential for crashes:

1. Install new standard shoulder rumble strips.
2. Remove washers from all guardrail and ensure that the height criteria is met.
3. Check and ensure that all CMP's are outside of the clear zone.
4. Replace damaged A-frames from all cattle guards.
5. Re-do all freeway interstate signing to conform to the current edition of the MUTCD and Department Standards. Most of the signs are either faded or dilapidated.
6. Install an additional "DO NOT ENTER" sign back to back with the stop sign at the Anderson Jct. Interchange SB OFF Ramp.
7. Remove all unauthorized median turn arounds.
8. Fence corner protecting CMP near the TOQUERVILLE sign (Exit 27), is at 28 feet from the travel lane (NB). Relocate or protect.
9. Perform shoulder dressing to bring ground surface at grade with the shoulder edge.
10. CMP at MP 29.95± (NB) is at 19 feet from the travel lane. Extend or protect.
11. CMP at MP 30.05± (NB) is at 16.2 feet from the travel lane. Extend or protect.
12. Replace blunt end on guardrail at the Browse Interchange with an adequate end treatment.
13. Acceleration length for the NB ON ramp at the Browse Interchange appears to be substandard.
14. Verify that CMP's are outside of the clear zone; visual inspection appears to show that some are inside the clear zone.
15. Remove blunt end section on guardrail at the Snowfield Ranch Exit 33 NB, and replace with an adequate end treatment.
16. Re-do all signing at the Snowfield Ranch Interchange (Exit 33) to conform to the current edition of the MUTCD and Department Standards.

A Benefit to Cost (B/C) Ratio Analysis was performed to determine the economic benefits derived from implementing the safety recommendations presented above. Using a 10-year service life and a discount rate of 9% the B/C ratio becomes 14.45/1.

Source documents are available at the Division of Traffic and Safety for additional analysis. If questions arise, please call me at 801-965-4045.

JL/eg

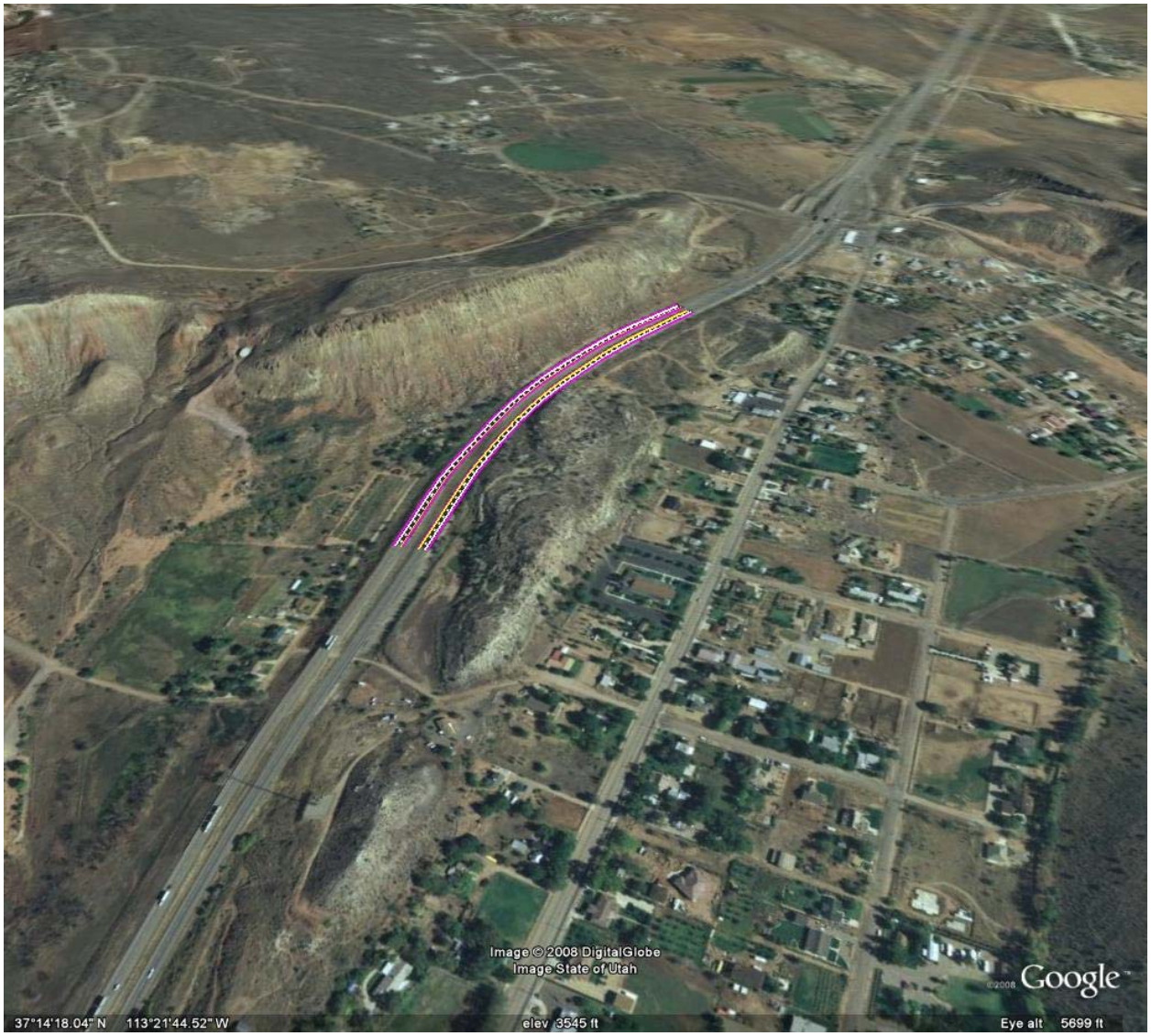
cc: Robert Hull, John Leonard, Roland Stanger, FHWA, Troy Torgerson, R-4, Zeke González, Mike Miles, R-4

UTAH DEPARTMENT OF TRANSPORTATION
Region 4

CONCEPT REPORT
For

Improve North and South Leeds Interchange

October 28, 2008



CONCEPT REPORT
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Table of Contents
Executive Summary
Concept Estimate
Roadway/Pavement Summary (Activities 54C, 58C)
Traffic and Safety Summary (Activity 64C)
Structure Summary (Activity 62C)
Environmental Summary (Activity 52C)
Right of Way Summary(Activity 56C)
Utility and Railroad Summary (Activity 68C)
ITS Summary (Activity 66C)
Public Involvement Summary (Activity 60C)

CONCEPT REPORT SUMMARY

SECTION 1: General Information

Project Name:	**Improve North and South Leeds Interchange**		
Project Manager:	**Kim Manwill**	**County:**	**Washington**
Pin Number:		**Begin Mile Post:**	**22.2**
Project Number:		**End Mile Post:**	**24.5**
Route Number:	**15**	**Design Year:**	**2014**
Functional Classification:	**Interstate**	**Design Speed:**	**80 mph**

Describe the Purpose/Need for this Project:

The purpose of this project is to address an accident cluster that was identified on the deficient horizontal curve at MP 23.2 and to correct the substandard ramp acceleration and deceleration lengths. To prevent the high number of crashes at MP 23.3, it was determined that realigning the curve to meet an 80 mph design speed, which would limit the number of crashes in the area.

Some of the Leeds Interchange acceleration and delectation lengths have been identified as being deficient. To bring the split interchange to standard, the ramp acceleration and deceleration lengths will be increased.

Major Project Risks:

- Oil Cost Escalation- Pavement costs make up the bulk of this projects budget. To mitigate the cost of pavement, a standard 10% contingency has been used.
- Sight Distance – Realigning the curve at MP 23.2 could make the sight distance worse at that location. The cut wall may need to be altered to insure proper sight distance.

Project Estimate and Timeline:

Planning Estimate:		**Proposed Construction FY:**	**2014**
Total Project Cost (Current Year):	**$4,636,000**	**Estimated Construction Duration:**	*1 year*
Construction Year Estimate (2011):	**$6,905,000**	**Recommended Commission Approved Amount:**	

Signature Block:

Project Manager **Date**	**Region Preconstruction Engineer** **Date**
Region STIP Workshop Chair **Date**	**Region Director** **Date**
Consultant **Date**	

SECTION 2: Design Information (Executive Summary)

Roadway / Pavement Summary (Activities 54C, 58C)	**Estimated Construction Cost:**	**$4,757,000**

Of the deficiencies identified on this project horizontal alignment, superelevation, ramp deficiencies, sight distance, clear zone, and guardrail will be fixed. The vertical clearance and the deficiencies not associated with the interchange or the deficient horizontal alignment will be fixed by the other projects in the area, Improve South Leeds NB Off-Ramp and Pavement Rehabilitation (MP 19 to 27) as identified in the I-15 Washington County Corridor Study.

Design exceptions may be needed for the deficient horizontal curve at MP 23.6.

No major drainage issues were identified for this project.

All pavement placed will be full depth pavement, consisting of 12" GB, 8.5" UTBC, 9.5" HMA, and 1.5" SMA.

Traffic and Safety Summary (Activity 64C)	**Estimated Construction Cost:**	**$31,000**

All guardrail and crash cushions associated with the interchange will be brought to standard with this project or the Pavement Rehabilitation (MP 19 to 27) project as identified in the I-15 Washington County Corridor Study.

Structures Summary (Activity 62C)	**Estimated Construction Cost:**	**$0**

No structural maintenance to be performed with this project.

Environmental Summary (Activity 52C)	**Estimated Mitigation Cost:**	**$0**

Archeological studies have been performed on almost all of the project area. There were a significant number of documented cultural sites from those surveys of the project, including some eligible sites.

Several sensitive species have been identified along the corridor. Species requiring survey are: Dwarf Bearclaw Poppy, Holmgren Milkvetch, Shivwits Milkvetch, and Desert Tortoise. The desert Tortoise requires tortoise clearance during the active season.

The environmental documentation cost has been included in the PE cost in the cost estimate.

CONCEPT REPORT SUMMARY

Right of Way Summary (Activity 56C)	**Estimated Property Cost:**	**$0**
No Right-of-Way impacts or acquisition expected.		

Utility and Railroad Summary (Activity 68C)	**Estimated Relocation Cost:**	**$0**
No utility or railroad conflicts expected.		

ITS Summary (Activity 66C)	**Estimated Construction Cost:**	**$0**
No ITS improvements on this project.		

Public Involvement Summary (Activity 60C)	**Estimated Cost:**	**$24,000**
The public involvement plan is to coordinate with local municipalities, Port of Entry, Truckers Association, Tourism Bureau, and local media, on project construction schedule and traffic impacts.		

Miscellaneous Summary:
This project is to be designed in coordination with three other Phase I projects in the area. The three Phase I projects are, Improve South Leeds NB Off-Ramp Interchange, Improve North and South Leeds Interchange, and Pavement Rehabilitation MP 19-27 as identified in the I-15 Washington County Corridor Study. The design of this project will need to be coordinated between the other projects in the area. The total construction cost includes concept report cost, PE, CE, and a 10% project contingency. See the Concept Estimate following this summary.

CONCEPT REPORT
Appendix A

SECTION 3: Project Log

Complete the Following:

Date Received	Deliverable
	Roadway/Pavement Summary (Activities 54C, 58C)
	Traffic and Safety Summary (Activity 64C)
	Structures Summary (Activity 62C)
	Environmental Summary (Activity 52C)
	Right of Way Summary (Activity 56C)
	Utility and Railroad Summary (Activity 68C)
	ITS Summary (Activity 66C)
	Public Involvement Summary (Activity 60C)

(Update this as major decisions are made regarding the project.)

Date	Decision Made
10/08	Preliminary Concept Report from I-15 Washington County Corridor Study

PIN ----- PROJECT # ----- Improve North and South Leeds Interchanges

Cost Estimate - Concept Level

Approximate Route Reference Post (BEGIN) =	22.200	(END) =	24.500	
Accumulated Mileage (BEGIN) =	22.200	(END) =	24.500	
Project Length =	2.300	miles	12,144 ft	
Current Year =	2008			
Assumed Construction Year =	2014			
Assumed Yearly Inflation for Construction and Utility Items (%/yr) =	7.0%	6 yrs for inflation		For projects 1 Year out use 10%, 2 Years 9%,
Assumed Yearly Inflation for Engineering Services (PE and CE) (%/yr) =	6.0%			
Assumed Yearly Inflation for Urban Residential Right of Way (%/yr) =	6.5%			
Assumed Yearly Inflation for Urban Commercial Right of Way (%/yr) =	4.0%			
Assumed Yearly Inflation for non-Urban Right of Way (%/yr) =	2.0%			
Construction Items Contingency (% of Construction) =	10.0%			10% Rural PB; 15% Urban PB; 20% Non PB
Preliminary Engineering (% of Construction + Incentives) =	8.0%			
Construction Engineering (% of Construction + Incentives) =	10.0%			

Item #					Cost	Remarks
Construction						
	Roadway and Drainage				$3,169,559	
	Traffic and Safety				$20,435	
	Structures				$0	
	Environmental Mitigation				$0	
	ITS				$0	
				Subtotal	$3,189,994	
			Construction Items Contingency (for minor items not listed)	(10%)	$318,999	
				Construction Subtotal	**$3,508,993**	
P.E. Cost				**P.E. Subtotal**	**$281,000**	8%
C.E. Cost				**C.E. Subtotal**	**$357,000**	10%
Right of Way Urban/Suburban Residential				**Right of Way Subtotal**	$0	
Right of Way Urban Suburban Commercial				**Right of Way Subtotal**	$0	
Right of Way non-Urban/Suburban				**Right of Way Subtotal**	$0	
Utilities				**Utilities Subtotal**	$0	
Incentives				**Incentives Subtotal**	$64,977	
Miscellaneous				**Miscellaneous Subtotal**	**$0**	

Cost Estimate (ePM screen 505)		2008		2014
Concept Report Cost	0.75%	**$26,000**		**$26,000**
P.E.		**$281,000**		**$398,604**
Right of Way		**$0**		**$0**
Utilities		**$0**		**$0**
Construction		**$3,508,993**		**$5,266,052**
C.E.		**$357,000**		**$506,411**
Incentives		**$64,977**		**$97,513**
Contingency	**10%**	**$423,797**		**$636,005**
Miscellaneous		**$0**		**$0**
	TOTAL	**$4,636,000**	**TOTAL**	**$6,905,000**

PROPOSED COMMISSION REQUEST	**TOTAL**	**$4,636,000**	**TOTAL**	**$6,905,000**

Cost Estimate Summary of Assumptions - Improve North and South Leeds Interchanges

Unit Weights			Application Rates	
Borrow	133	lb/cf		
Gran. Backfill Borrow	133	lb/cf		
Granular Borrow	133	lb/cf		
UTBC	136	lb/cf		
HMA	152	lb/cf		
SMA	149	lb/cf		
Asphalt Cement	6.20%	OGSC		
Prime Coat	250	gal/ton	0.5	gal/sy
Tack Coat	240	gal/ton	0.08	gal/sy
Emulsified Asphalt LMCRS-2	250	gal/ton	0.4	gal/sy
Flush Coat	245	gal/ton	0.11	gal/sy
Water			42	gal/cy GB
			51	gal/cy UTBC
			45	gal/cy Borrow/Embank

Choose Either Ton or Vol
Manually Input

Water			
Material	Vol cy	gal	1,000 gal
GB	9785	410970	411.0
UTBC	5983	305133	305.1
Borrow	3112	140040	140.0
Embankment	2600	117000	117.0
TOTAL			**974**

Oil								
Roadway	Prime Coat		Tack Coat			LMCRS-2		Flush Coat	
	Area sy	Tons	# of apps	Area sy	Tons	Area sy	Tons	Area sy	Tons
NB Curve	10690	21.4	0	9497	0.0				
SB Curve	10690	21.4	0	9497	0.0				
			0						
S Leeds NB off	1386	2.8	0						
S Leeds SB on	1584	3.2	0						
N Leeds SB off	990	2.0							
TOTALS		**51**			**0**		**0**		**0**

Pavements

Roadway	Length	Top Width	Side Slope	GB				UTBC				HMA			SMA		Asphalt Cement	Chip Seal	4" LCBC		PCCP		Mill - ___"	
				Depth	Width	Vol	Tons	Depth	Width	Vol	Tons	Depth	Width	Tons	Depth	Tons			Width	Area	Depth	Area	Depth	Area
*Full Depth Work **(1 Side)**:*	ft	ft		in	ft	cy		in	ft	cy		in	ft		in		Tons	sy	ft	sy	in	sy	in	sy
NB Curve	2100	38	1/6	12	51.6	4017	7212	8.5	45.8	2524	4634	9.5	40.7	5142	1.5	743								
SB Curve	2100	38	1/6	12	51.6	4017	7212	8.5	45.8	2524	4634	9.5	40.7	5142	1.5	743								
S Leeds NB off	700	10	1/6	12	23.6	613	1101	8.5	17.8	327	601	9.5	12.7	535	1.5	65								
S Leeds SB on	800	10	1/6	12	23.6	700	1258	8.5	17.8	374	686	9.5	12.7	611	1.5	75								
N Leeds SB off	500	10	1/6	12	23.6	438	786	8.5	17.8	234	429	9.5	12.7	382	1.5	47								
Mill/Overlay Work:																								
																							2	0
																							2	0
																							2	0
																							2	0
																							2	0
																							2	0
TOTALS						**9785**	**17568**			**5983**	**10985**			**11814**		**1673**	**0**	**0**		**0**		**0**		**0**

Earthwork

Roadway	Roadway Excavation				Borrow					Granular Backfill Borrow				
	Length	Depth	Width	Vol	Length	Depth	Width	Vol	Tons	Length	Depth	Width	Vol	Tons
	ft	in	ft	cy	ft	in	ft	cy		ft	in	ft	cy	
NB Curve	2100	32	38	7758					0				0	0
SB Curve	2100	32	38	7758									0	0
													0	0
S Leeds NB off					700	36	14	1089						
S Leeds SB on					800	36	14	1244						
N Leeds SB off					500	36	14	778						
Cut Wall	1050	600	16	31111										
TOTALS				**46628**				**3112**	**0**				**0**	**0**

Fill

Assumptions
width 14 ft additional to bring to current standard of 30 ft clear zone at 6:1
depth 36 inch average

Cross Section	inside shldr	lane width	outside shldr	total
NB& SB	4	24	10	38
Ramps	4	14	6	24

Roadway and Drainage - Improve North and South Leeds Interchanges

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Item #	Item	Quantity	Price	Units	Cost	Remarks
Roadway and Drainage						
012850010	Mobilization	1	$350,000.00	Lump	$350,000	10% of construction
013150010	Public Information Services	0	$15,000.00	Lump	$0	
015540005	Traffic Control	1	$175,000.00	Lump	$175,000	5% of construction
01557001*	Maintenance of Traffic	0	$0.00	Lump	$0	
015720010	Dust Control & Watering	974	$25.00	1000 gal	$24,350	
017210020	Survey	1	$35,000.00	Lump	$35,000	1% of construction
020560005	Borrow (Plan Quantity)	3112	$15.00	Cu yd	$46,680	
020560015	Granular Borrow (Plan Quantity)	9785	$17.00	Cu yd	$166,345	
020560025	Granular Backfill Borrow (Plan Quantity)	0	$35.19	Cu yd	$0	
020560030	Granular Backfill Borrow	0	$10.00	Ton	$0	
022210015	Remove Bridge	0	$22,594.54	each	$0	
002210080	Remove Fence	0	$1.08	ft	$0	
022210095	Remove Pipe Culvert	0	$20.00	ft	$0	
023160020	Roadway Excavation (Plan Quantity)	46628	$12.00	Cu yd	$559,536	
023310020	Clearing and Grubbing	0	$2,400.00	Acre	$0	
023730010	Loose Riprap	0	$90.00	Cu yd	$0	
027210070	Untreated Base Course 3/4 inch or 1 inch Max	10985	$23.50	Ton	$258,148	
027410060	HMA - 3/4 Inch	11814	$110.00	Ton	$1,299,540	
027480010	Liquid Asphalt MC-70 or MC-250	51	$1,000.00	Ton	$51,000	
027480030	Emulsified Asphalt SS-1	0	$250.00	Ton	$0	
027520020	Portland Cement Concrete Pavement 9 inch Thick	0	$27.82	Sq yd	$0	
027710025	Concrete Curb and Gutter Type B1	0	$14.00	ft	$0	
027760010	Concrete Sidewalk	0	$20.00	Sq yd	$0	
027850030	Chip Seal Coat, Type C	0	$1.00	Sq yd	$0	
027850060	Emulsified Asphalt LMCRS-2	0	$350.00	Ton	$0	
02785008*	Flush Coat	0	$250.00	Ton	$0	
02744000*	SMA - 1/2 inch	1673	$120.00	Ton	$200,760	
027860020	Asphalt Cement PG 64-34	0	$200.00	Ton	$0	
028220010	Right of Way Fence, Type G (Deer Fence)	0	$4.00	ft	$0	
029120050	Strip, Stockpile, and Spread Topsoil	0	$1.00	Sq yd	$0	Assumed LxW
029220010	Drill Seed	0	$470.00	Acre	$0	Assumed LxW
029610050	Rotomilling	0	$4.50	Sq yd	$0	
026100032	24 Inch Pipe Culvert, Class C	0	$24.79	ft	$3,200	
026100034	24 Inch Pipe Culvert, Class C	0	$36.14	ft	$0	
026100038	36 Inch Pipe Culvert, Class C	0	$65.72	ft	$0	
026100042	48 Inch Pipe Culvert, Class C	0	$98.02	ft	$0	
029620010	In-Place Cold Recycled Asphaltic Base	0	$2.60	Sq yd	$0	
Roadway and Drainage Subtotal					**$3,169,559**	Back to Main

Traffic, Safety & ITS - Improve North and South Leeds Interchanges

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	Item	Quantity	Price	Units	Cost	Remarks
Traffic, Safety & ITS						
Traffic						
	W-Beam Guardrail	800	$22.00	ft	$17,600	
	Crash Cushion Type G	0	$3,000.00	Each	$0	
	Concrete Barrier (New Jersey Shape)	0	$50.00	ft	$0	
	Pavement Marking Paint	9450	$0.30	ft	$2,835	
	Pavement Message Paint	0	$0.00	Each	$0	
	Signs	0	$120,000.00	Lump	$0	
Signals						
Lighting						
	Highway Lighting System	0	$150,000.00	Each	$0	
Traffic and Safety Subtotal					**$20,435**	
ITS						
	Multiduct Conduit	0	$50,000.00	Lump	$0	
ITS Subtotal					**$0**	Back to MAIN

Structures - Improve North and South Leeds Interchanges

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Item #	Item	Quantity	Price	Units	Cost	Remarks
Structures						
Bridges						
	Structure Maintenance	0	$100,000.00		$0	
Walls						
	Retaining Wall	0	$50.00	Sq ft	$0	Assumed LxH (wall area)
				ft		
Hydraulics						
	Extend Box Culvert	0	$200.00	ft	$0	
	New Box Culvert					
	Scour Mitigation					
Geotech						
	Geotech Report	0	$25,000.00	Lump	$0	
	Drilling	0	$25,000.00	Lump	$0	
Structures Subtotal					**$0**	

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Environmental and Landscaping - Improve North and South Leeds Interchanges Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Environmental & Landscaping						
Environmental						
	Wetland Mitigation	0	$50,000.00	Lump	$0	
	Noise Wall	0	$1,000.00	ft	$0	
Temporary Erosion Control						
	Silt Fence	0	$20.00	Ft	$0	
	Erosion Control Supervisor	0	$20,000.00	Lump	$0	
	Check Dams	0	$250.00	Each	$0	
Landscaping						
	Contractor Furnished Topsoil			sq ft		
	Strip, Stockpile, Spread Topsoil			sq ft		
	Wood Fiber Mulch			acre		
	Broadcast Seed			acre		
	Drill Seed			acre		
Environmental Mitigation Subtotal					$0	Back to MAIN

Miscellaneous - Improve North and South Leeds Interchanges Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Utilities						
	Relocate Water Line	0	$500.00	Lump	$0	
	Relocate Gas Line	0	$50,000.00	Lump	$0	
	Relocate Power Line			Lump		
	Relocate Fiber Optic			Lump		
	Relocate Phone			Lump		
	S.U.E	0	$20,000.00	Lump	$0	Assume $1.00 per foot per utility
Utilities Subtotal					**$0**	
Right-of-way						
	Urban/Suburban Residential	0	$5.00	sq ft	$0	Wasatch Front/Cache Valley/Cedar City/ Saint George areas
	Urban/Suburban Commercial	0	$15.00	sq ft	$0	Wasatch Front/Cache Valley/Cedar City/ Saint George areas
	non-Urban/Suburban Residential	0	$5.00	sq ft	$0	
	non-Urban/Suburban Commercial	0	$15.00	sq ft	$0	
	non-Urban/Suburban Farm	0	$1.00	sq ft	$0	
Right-of-Way Subtotal					**$0**	
Incentives						
	HMA Properties	0	$2.00	ton	$0	Max $2.31per ton of HMA
	Smoothness	5%	$1,299,540.00	lump	$64,977	% of HMA cost
	OGSC Properties	0	$1.75	ton	$0	Max $1.83 per ton of OGSC
	Lane Rental Incentive	0	$10,000.00	Lump	$0	
	Early Completion	0	$50,000.00	Lump	$0	
Incentives Subtotal					**$64,977**	
						Back to MAIN

Roadway / Pavement Summary (Activities 54C, 58C)

Project Design Criteria, as developed in the I-15 Washington County Corridor Study, isolated at the end of the appendix. The following is a summary of the deficiencies located on the project.

Horizontal Alignment

The minimum horizontal curve radius for an 80 mph design speed is 3050 ft. I-15 was originally designed with a 65 mph design speed. With the increase in the speed limit several horizontal curves have become deficient. A summary of the deficient horizontal alignments and superelevations can be seen in the table below.

Deficient Horizontal Alignment

Direction	MP	Existing Radius (feet)	Existing Superelevation (e)	Notes
NB & SB	23.2	2864.93	4.9	65 mph design speed
NB & SB	23.6	2864.93	4.9	65 mph design speed

An accident cluster was identified on the horizontal curve at MP 23.2. This curve is to be realigned by this project. The curve at MP 23.6 is to have a warning sign placed with the Safety Improvements project described in the I-15 Washington County Corridor Study.

Superelevations

The superelevations for the project were originally design for 65 mph. The deficient superelevations will need to be brought to an 80 mph design speed.

Stopping Sight Distance

The design stopping sight distance for the project is 910 ft for an 80 mph design speed. The table below summarizes the locations with deficient sight distance.

Deficient Stopping Sight Distance

Direction	From	To	Notes
NB	23.1	23.3	NB sight distance is limited by cut wall

The sight distance will need to be corrected by either removing more of the cut wall or relocating the roadway to the west.

Vertical Clearance

The structure at the North Leeds Interchange currently fails to meet the UDOT 16.5 ft vertical clearance requirement. No alternate route exists to bypass the structure. To correct this deficient clearance it will require the grades of the cross road (Silver Reef Rd) to be realigned.

Vertical Clearance

ID	Year	Direction	MP	Clearance	Feature Crossed	Notes
1D 680	1962	NB	23.729	15’-0”	I-15 Over SR-228, Int. X-Road	Fails

3D 680	1962	SB	23.729	15’-0”	I-15 Over SR-228, Int. X-Road	Fails

The vertical clearance will not be corrected with this project, but will be corrected with the Pavement Rehabilitation (MP 19 to 27) project as identified in the I-15 Washington County Corridor Study.

Clear Zone

The minimum clear zone for the project is 30 to 34 ft. Locations denoted in the tables below are deficient due to steep sideslopes or obstacles in the clear zone.

Deficient Clear Zone

Direction	From MP	To MP	Notes
NB	22.20	22.60	Steep sideslopes
NB	23.06	23.61	Steep sideslopes

This project and the Pavement Rehabilitation (MP 19 to 27) project, as identified in the I-15 Washington County Corridor Study, will fix all clear zone issues by eliminating the obstacle, correcting the side slope, or protecting the obstacle.

Guardrail

Deficient guardrail was defined as guardrail that did not meet the height standard of 32 inches, guardrail with Texas turndown end sections, and guardrail/barrier with insufficient length of need. As a general note, no barrier offset was found at any guardrail or barrier location on the project. A summary of the deficient guardrail and length of need is located in the table below.

Insufficient length of need

Direction	MP	Notes
SB	21.97	Insufficient length of need
NB	22.93	Insufficient length of need
SB	24.38	Insufficient length of need

All guardrail on the project will be brought to standard.

Ramp Deficiencies

The table below summarizes the deficient ramp acceleration/deceleration lengths.

Deficient Ramp Acceleration/Deceleration Lengths

Direction	MP	Existing Length	Type	Notes
NB Decel	22.15	215.0	Tapered	Deficient deceleration
SB Accl	22.48	425.0	Tapered	Deficient acceleration
NB Accl	23.86	519.0	Parallel	Deficient acceleration

This project will correct all deficient acceleration and deceleration lengths.

Drainage
No major drainage issues were identified for this project.

Pavement Design
A preliminary pavement section has been provided for cost estimate purposes. To realign the deficient curve and make ramp improvements will require new pavement. The region pavement engineer has preliminarily recommended the following generic new pavement section:

- 12 inch granular borrow
- 8.5 inch untreated base course
- 9.5 inch hot mix asphalt
- 1.5 inch stone matrix asphalt

Traffic and Safety Summary (Activity 64C)

An Operational safety report will need to be completed by UDOT traffic and safety. In addition to their report, a project specific analysis of corridor safety was completed by identifying locations with a project based high number of severe accidents (accidents level 3 or higher). By geographically analyzing the accident data from 2002 to 2005, accident clusters were identified by determining grouping location of severe accidents. Some of the accident clusters were also verified by comments from UDOT maintenance and public comment.

Accident Clusters

MP	Description
23.3	Deficient curve, super is not sufficient for posted speed. The NB lanes also have deficient sight distance, there is a cut wall blocking the sight distance.

The accident cluster at MP 23.3 will be addressed by realigning the curve to meet an 80 mph design speed.

Structures Summary (Activity 62C)

No structural work is to be completed as part of this project.

Environmental Summary (Activity 52C)

A categorical exclusion is the expected level of environmental documentation for the project.

Cultural and Paleontological
Archeological studies have been performed on almost all of the project area. There were a significant number of documented cultural sites from those surveys of the project, including some eligible sites. To

see a list of surveys and list of eligible sites, see the environmental section of the I-15 Washington County Corridor Study Technical Reports.

Wetlands
No wetlands impacts are anticipated. Proper erosion control including rip rap, vegetation, and other techniques should be used throughout the project.

Environmental
Dwarf Bearclaw Poppy - Potential habitat exists between MP 1-6 and 18-25. There is no critical habitat designated for this species. An existing population's map is available. The Dwarf Bearclaw Poppy flowers between mid-April to May, with the survey season in May.

Holmgren Milkvetch - Potential habitat exists between MP 1-6 and 18-25. Designated critical habitat is between MP 1-2. Critical habitat map and existing populations map are available. The Holmgren Milkvetch flowers between March and April with fruits by the end of April and pods that persist until end of May. Survey season is in May.

Shivwits Milkvetch - Potential habitat between MP 18-25 with critical habitat designated within the same area. There is no map available of the critical habitat. However an existing population's map is available. The Shivwits Milkvetch flowers between April and late May, by the end of June most of the plants dry up. Survey season is in May.

Desert Tortoise - Potential tortoise habitat is between MP 1-5 & MP 13-22. The Red Cliffs Desert Preserve is on north side of I-15 between MP 13.5 – 21.5. Designated critical habitat between MP 13.5-20 exists inside of the I-15 rights-of way. A map showing the designated critical habitat and preserve is available. Also a Habitat Conservation Plan is available for this species. A Presence/absence survey can be completed anytime. Clearance of tortoise is required during active season. Active season is from March 15 to October 15.

Right of Way Summary (Activity 56C)
No right-of-way impacts expected.

Utility and Railroad Summary (Activity 68C)
No utility or railroad conflicts identified.

ITS Summary (Activity 66C)
No ITS implementation on this project.

Public Involvement Summary (Activity 60C)

The public involvement plan is to coordinate with local municipalities, Port of Entry, Truckers Association, Tourism Bureau, and local media, on project construction schedule and traffic impacts.

PROJECT DESIGN CRITERIA

I. PROJECT DESCRIPTION

Date: January 17, 2008

Project Name	**I-15 Corridor Study, Washington County MP 0 to 42**		
Project Number	**S-R499(48)**	PIN	**6361**

Describe the scope of the project: A corridor study for I-15 from the Arizona State Line (MP 0) in Washington County to the New Harmony Interchange (MP 42) in Washington County. The purpose of the project is to identify corridor needs and constraints, provide solutions, prioritize and develop a schedule for implementing those solutions, and provide concept reports for immediate projects. Projects identified will be included on the STIP. The time period for the corridor study includes analysis for the current year 2007 and the next 30 years (2040).

II. DESIGN STANDARDS BY ROADWAY (complete for each roadway on your project)

ROADWAY: I-15, MP 0.0 to MP 11.5

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**70 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	70 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft								
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504-505 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	2040 ft			Mainline					

I-15, MP 0.0 to MP 11.5 (continued)

12 Critical Elements	UDOT Standard			Proposed			Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value		Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Mainline	181	247	Mainline				
Profile Grades	% Min		% Max	% Min		% Max		AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5					
Stopping-Sight Distance	Minimum			Minimum				AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	730 ft		Mainline				
Cross Slope	Minimum							AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%							
Superelevation	Maximum Superelevation (UDOT Standard)							UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%							
Structural Capacity	Design Loading							Reference roadway design MOI, pg 288
	HS20 existing bridges HL-93 new structures							
Vertical Clearance*	Minimum							UDOT Roadway Design MOI p. 64
	16 feet 6 inches							
Bridge Width	Minimum							UDOT Roadway Design MOI p. 63
	Add 2 ft to travel way to each side of bridge							

I-15, MP 0.0 to MP 11.5 (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: I-15, MP 11.5 to MP 42

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**80 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	80 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft				.				
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	3050 ft			Mainline					
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value			AASHTO GB p. 272 & 277
	Mainline	231	384		Mainline					
Profile Grades	% Min		% Max		% Min		% Max			AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5							
Stopping-Sight Distance	Minimum				Minimum					AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	910 ft			Mainline					
Cross Slope	Minimum									AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%									
Superelevation	Maximum Superelevation (UDOT Standard)									UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%									

I-15, MP 11.5 to MP 42

12 Critical Elements	UDOT Standard	Proposed	Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Structural Capacity	Design Loading HS20 existing bridges HL-93 new structures			Reference roadway design MOI, pg 288
Vertical Clearance*	Minimum 16 feet 6 inches			UDOT Roadway Design MOI p. 64
Bridge Width	Minimum Add 2 ft to travel way to each side of bridge			UDOT Roadway Design MOI p. 63

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft (not in roadside table)			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General Off Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General Off Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	40 mph or less 14 ft to 16 ft 50 mph 18 ft to 20 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1 sideslope
Ramp Terminal Sight Distance	25 mph – 155 ft			AASHTO GB p. 828
Ramp Design	UDOT STD DWG DD 6			AASHTO GB p. 825+
Gores	UDOT STD DWG DD 6			AASHTO GB p. 832-837
Ramp Terminals	UDOT STD DWG DD 6			AASHTO GB p. 840-845
Ramp Entrances	UDOT STD DWG DD 6			AASHTO GB p. 845
Acceleration Lanes	AASHTO p. 847, 848			
Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General Off Ramp (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Guardrail Bridge Connection	N/A			
Sideslopes	6:1 in clear zone			UDOT STD DWG DD 4 AASHTO GB p. 326-329
Intersection Sight Distance	UDOT Roadway Design MOI p. 127-128 AASHTO GB p. 650-677			
Shoulder/Travel way (gutter pan)	Gutter pan not included in travelway or shoulder			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General On Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	**See attached**	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General On Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	40 mph or less 14 ft to 16 ft 50 mph 18 ft to 20 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1 sideslope
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Ramp Design	UDOT STD DWG DD 6			AASHTO GB p. 825+
Gores	UDOT STD DWG DD 6			AASHTO GB p. 832-837
Ramp Terminals	UDOT STD DWG DD 6			AASHTO GB p. 840-845
Ramp Entrances	UDOT STD DWG DD 6			AASHTO GB p. 845
Acceleration Lanes	AASHTO p. 847, 848			
Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General On Ramp (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Guardrail Bridge Connection	N/A			
Sideslopes	6:1 in clear zone			UDOT STD DWG DD 4 AASHTO GB p. 326-329
Intersection Sight Distance	UDOT Roadway Design MOI p. 127-128 AASHTO GB p. 650-677			
Shoulder/Travel way (gutter pan)	Gutter pan not included in travelway or shoulder			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

Prepared by:_____ Phone Number:_____

Verified Only - Region Preconstruction Engineer:_____ Date:_____

Approved by Region Preconstruction Engineer, Consulting Engineer,
or Local Government Engineer:_____ Date:_____

Required Signatures

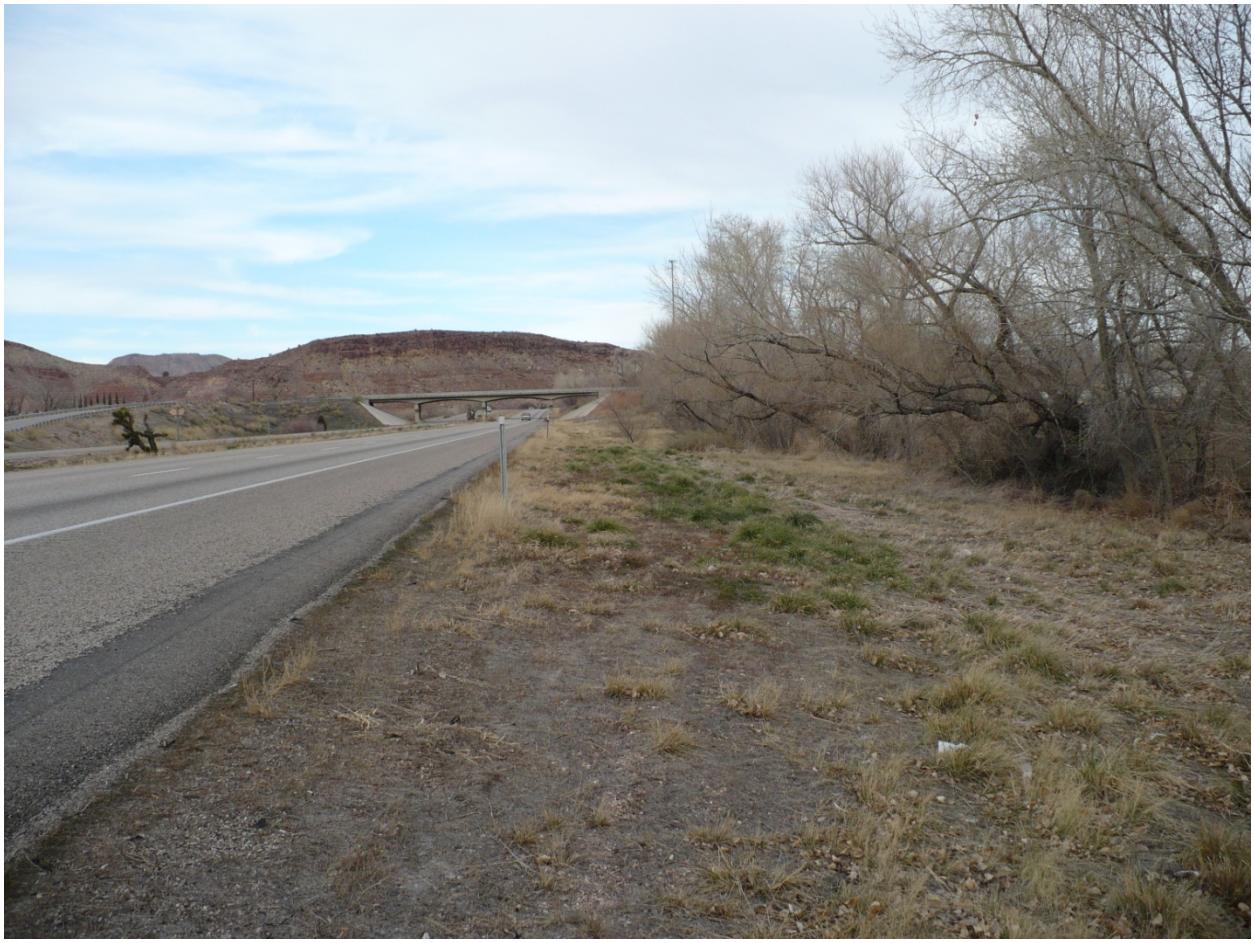
Local government projects require Regional Preconstruction Engineer signature for verification and the Local Government Engineer signature for approval.
Local government projects on State highway system require the Region Preconstruction Engineer signature for approval.
All other projects require Region Preconstruction Engineer signature for approval.

UTAH DEPARTMENT OF TRANSPORTATION
Region 4

CONCEPT REPORT
For

Pavement Rehabilitation (MP 19 to 27)

October 28, 2008



CONCEPT REPORT
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Executive Summary
Concept Estimate
Roadway/Pavement Summary (Activities 54C, 58C)
Traffic and Safety Summary (Activity 64C)
Structure Summary (Activity 62C)
Environmental Summary (Activity 52C)
Right of Way Summary(Activity 56C)
Utility and Railroad Summary (Activity 68C)
ITS Summary (Activity 66C)
Public Involvement Summary (Activity 60C)

CONCEPT REPORT SUMMARY

SECTION 1: General Information

Project Name:	**Pavement Rehabilitation (MP 19 to 27)**		
Project Manager:	**Kim Manwill**	**County:**	**Washington**
Pin Number:		**Begin Mile Post:**	**19.4**
Project Number:		**End Mile Post:**	**27.3**
Route Number:	**15**	**Design Year:**	**2015**
Functional Classification:	**Interstate**	**Design Speed:**	**80 mph**

Describe the Purpose/Need for this Project:

The purpose of the Pavement Rehabilitation (MP 19 to 27) project is to maintain the existing pavement, structures, and roadway to a satisfactory level.

The structures will receive preventative maintenance. This includes, asphalt surfacing removal, pothole patching, waterproofing the membrane, overlays, sealing the parapet, and joint replacement.

The clear zone and guardrail deficiencies will be corrected.

Major Project Risks:

- Oil Cost Escalation- Pavement costs make up the bulk of this projects budget. To mitigate the cost of pavement, a standard 10% contingency has been used.

Project Estimate and Timeline:

Planning Estimate:		**Proposed Construction FY:**	**2015**
Total Project Cost (Current Year):	**$9,335,900**	**Estimated Construction Duration:**	*1 year*
Construction Year Estimate (2011):	**$14,860,000**	**Recommended Commission Approved Amount:**	

Signature Block:

Project Manager **Date**	**Region Preconstruction Engineer** **Date**
Region STIP Workshop Chair **Date**	**Region Director** **Date**
Consultant **Date**	

SECTION 2: Design Information (Executive Summary)

Roadway / Pavement Summary (Activities 54C, 58C)	**Estimated Construction Cost:**	**$9,324,000**

Of the deficiencies identified on this project vertical clearance, clear zone, and guardrail will be fixed with this project. Horizontal alignment, ramp deficiencies, and stopping sight distance will be fixed by the other projects in the area, Improve South Leeds NB Off-Ramp Interchange and Improve North and South Leeds Interchange as identified in the I-15 Washington County Corridor Study. The vertical alignments will not be brought to standard, because no accident cluster was associated with any of the deficiencies.

Design exceptions will be needed for the vertical and horizontal alignments.

No major drainage issues were identified for this project.

The pavement will require a functional overlay to bring the pavement to a satisfactory level. The most rigorous treatment for the project would be a 1.5" stone matrix asphalt.

Traffic and Safety Summary (Activity 64C)	**Estimated Construction Cost:**	**$362,000**

All guardrail and crash cushions will be brought to standard. Also all signs need to be replaced and if necessary brought to current standard.

Structures Summary (Activity 62C)	**Estimated Construction Cost:**	**$562,000**

The project structural plan is to perform preventative maintenance to all structures within the project limits. This includes, asphalt surfacing removal, pothole patching, waterproofing the membrane, overlays, sealing the parapet, and joint replacement.

Environmental Summary (Activity 52C)	**Estimated Mitigation Cost:**	**$42,000**

A categorical exclusion is the expected level of environmental documentation of the project.

Archeological studies have been performed on almost all of the project area. There were a significant number of documented cultural sites from those surveys of the project, including some eligible sites.

Several sensitive species have been identified along the corridor. Species requiring survey are: Virgin Spinedace, Dwarf Bearclaw Poppy, Holmgren Milkvetch, Shivwits Milkvetch, and Desert Tortoise. The Virgin Spinedace requires fish clearance prior to any construction in Quail Creek. The desert Tortoise requires tortoise clearance during the active season.

Another sensitive species that needs consideration is the Desert Sucker, which is a state species of concern.

The environmental documentation cost has been included in the PE cost in the cost estimate. The environmental mitigation includes silt fence, erosion control, and check dams.

Right of Way Summary (Activity 56C)	**Estimated Property Cost:**	**$0**
No Right-of-Way impacts or acquisition expected.		

Utility and Railroad Summary (Activity 68C)	**Estimated Relocation Cost:**	**$0**
No utility or railroad conflicts expected.		

ITS Summary (Activity 66C)	**Estimated Construction Cost:**	**$0**
No ITS improvements on this project.		

Public Involvement Summary (Activity 60C)	**Estimated Cost:**	**$15,000**
The public involvement plan is to coordinate with local municipalities, Port of Entry, Truckers Association, Tourism Bureau, and local media, on project construction schedule and traffic impacts.		

Miscellaneous Summary:

This project is to be designed in coordination with three other Phase I projects in the area. The three Phase I projects are, Improve South Leeds NB Off-Ramp Interchange, Improve North and South Leeds Interchange, and Pavement Rehabilitation (MP 19 to 27), as identified in the I-15 Washington County Corridor Study. The design will need to be coordinated between the three projects.

The total construction cost includes concept report cost, PE, CE, and a 10% project contingency. See the Concept Estimate following this summary.

CONCEPT REPORT
Appendix A

SECTION 3: Project Log

Complete the Following:

Date Received	Deliverable
	Roadway/Pavement Summary (Activities 54C, 58C)
	Traffic and Safety Summary (Activity 64C)
	Structures Summary (Activity 62C)
	Environmental Summary (Activity 52C)
	Right of Way Summary (Activity 56C)
	Utility and Railroad Summary (Activity 68C)
	ITS Summary (Activity 66C)
	Public Involvement Summary (Activity 60C)

(Update this as major decisions are made regarding the project.)

Date	Decision Made
10/08	Preliminary Concept Report from I-15 Washington County Corridor Study

PIN ----- PROJECT # ----- Pavement Rehabilitation (MP 19 to 27)

Cost Estimate - Concept Level

Approximate Route Reference Post (BEGIN) =	19.414	(END) =	27.287	
Accumulated Mileage (BEGIN) =	19.414	(END) =	27.287	
Project Length =	7.873	miles	41,569 ft	
Current Year =	2008			
Assumed Construction Year =	2015			
Assumed Yearly Inflation for Construction and Utility Items (%/yr) =	7.0%	7 yrs for inflation		For projects 1 Year out use 10%, 2 Years 9%,
Assumed Yearly Inflation for Engineering Services (PE and CE) (%/yr) =	6.0%			
Assumed Yearly Inflation for Urban Residential Right of Way (%/yr) =	6.5%			
Assumed Yearly Inflation for Urban Commercial Right of Way (%/yr) =	4.0%			
Assumed Yearly Inflation for non-Urban Right of Way (%/yr) =	2.0%			
Construction Items Contingency (% of Construction) =	10.0%			10% Rural PB; 15% Urban PB; 20% Non PB
Preliminary Engineering (% of Construction + Incentives) =	8.0%			
Construction Engineering (% of Construction + Incentives) =	10.0%			

Item #					Cost	Remarks
Construction						
	Roadway and Drainage				$5,806,329	
	Traffic and Safety				$225,495	
	Structures				$350,000	
	Environmental Mitigation				$26,000	
	ITS				$0	
				Subtotal	$6,407,824	
			Construction Items Contingency (for minor items not listed)	(10%)	$640,782	
				Construction Subtotal	**$7,048,606**	
P.E. Cost				**P.E. Subtotal**	**$564,000**	8%
C.E. Cost				**C.E. Subtotal**	**$720,000**	10%
Right of Way Urban/Suburban Residential				**Right of Way Subtotal**	$0	
Right of Way Urban Suburban Commercial				**Right of Way Subtotal**	$0	
Right of Way non-Urban/Suburban				**Right of Way Subtotal**	$0	
Utilities				**Utilities Subtotal**	$0	
Incentives				**Incentives Subtotal**	$150,853	
Miscellaneous				**Miscellaneous Subtotal**	**$0**	

Cost Estimate (ePM screen 505)		2008		2015
Concept Report Cost	0.50%	**$35,000**		**$53,000**
P.E.		**$564,000**		**$848,000**
Right of Way		**$0**		**$0**
Utilities		**$0**		**$0**
Construction		**$7,049,000**		**$11,319,000**
C.E.		**$720,000**		**$1,083,000**
Incentives		**$151,000**		**$242,000**
Contingency	**10%**	**$851,900**		**$1,368,000**
Miscellaneous		**$0**		**$0**
	TOTAL	**$9,335,900**	**TOTAL**	**$14,860,000**

PROPOSED COMMISSION REQUEST	**TOTAL**	**$9,335,900**	**TOTAL**	**$14,860,000**

Cost Estimate Summary of Assumptions - Pavement Rehabilitation (MP 19 to 27)

Unit Weights			Application Rates	
Borrow	133	lb/cf		
Gran. Backfill Borrow	133	lb/cf		
Granular Borrow	133	lb/cf		
UTBC	136	lb/cf		
HMA	152	lb/cf		
SMA	149	lb/cf		
Asphalt Cement	6.20%	OGSC		
Prime Coat	250	gal/ton	0.5	gal/sy
Tack Coat	240	gal/ton	0.08	gal/sy
Emulsified Asphalt LMCRS-2	250	gal/ton	0.4	gal/sy
Flush Coat	245	gal/ton	0.11	gal/sy
Water			42	gal/cy GB
			51	gal/cy UTBC
			45	gal/cy Borrow/Embank

Choose Either Ton or Vol
Manually Input

Water			
Material	Vol	gal	1,000
	cy		gal
GB	0	0	0.0
UTBC	463	23613	23.6
Borrow	39112	2E+06	1760.0
Embankment	6000	270000	270.0
TOTAL			2054

Oil								
Roadway	Prime Coat		Tack Coat			LMCRS-2		Flush Coat	
	Area	Tons	# of apps	Area	Tons	Area	Tons	Area	Tons
	sy			sy		sy		sy	
Regrade Silver Rd	1959	3.9	0	1801	0.0				
			0						
			0						
			0						
			0						
TOTALS		4			0		0		0

Pavements

Roadway	Length	Top Width	Side Slope	GB				UTBC				HMA			SMA		Asphalt Cement	Chip Seal	4" LCBC		CIPR		Mill - ___"	
				Depth	Width	Vol	Tons	Depth	Width	Vol	Tons	Depth	Width	Tons	Depth	Tons			Width	Area	Depth	Area	Depth	Area
*Full Depth Work **(1 Side)**:*	ft	ft		in	ft	cy		in	ft	cy		in	ft		in		Tons	sy	ft	sy	in	sy	in	sy
Regrade Silver Rd	500	32	1/6					8.5	35.3	463	849	1.5	32.4	154	1.5	149								
Mill/Overlay Work:																								
NB	41569	38	1												1.5	14710								
SB	41569	38	1												1.5	14710								
S Leeds NB off	800	24	1												1.5	179								
S Leeds SB on	1100	24	1												1.5	246								
N Leeds SB off	1000	24	1												1.5	224								
N Leeds NB on	2100	24	1												1.5	469								
TOTALS						0	0			463	850			155		30687	0	0		0		0		0

Earthwork

Roadway	Roadway Excavation				Borrow					Granular Backfill Borrow				
	Length	Depth	Width	Vol	Length	Depth	Width	Vol	Tons	Length	Depth	Width	Vol	Tons
	ft	in	ft	cy	ft	in	ft	cy		ft	in	ft	cy	
Regrade Silver Rd	500	32	10	486				0	0				0	0
				0				0	0				0	0
				0				0	0				0	0
NB					31680	20	10	19556	35112					
SB					31680	20	10	19556	35112					
TOTALS				487				39112	70224				0	0

Fill

Assumptions
width 10 ft additional to bring to current standard of 30 ft clear zone at 6:1
depth 20 inch average

Cross Section	inside shldr	lane width	outside shldr	total
NB& SB	4	24	10	38
Ramps	4	14	6	24
Regarded Silver Rd	-	24	4X2	32

Roadway and Drainage - Pavement Rehabilitation - Functional Overlay (MP 19 to 27) Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Roadway and Drainage						
012850010	Mobilization	1	$700,000.00	Lump	$700,000	10% of construction
013150010	Public Information Services	1	$15,000.00	Lump	$15,000	
015540005	Traffic Control	1	$350,000.00	Lump	$350,000	5% of construction
01557001*	Maintenance of Traffic	0	$0.00	Lump	$0	
015720010	Dust Control & Watering	2054	$25.00	1000 gal	$51,350	
017210020	Survey	1	$70,000.00	Lump	$70,000	1% of construction
020560005	Borrow (Plan Quantity)	39112	$15.00	Cu yd	$586,680	
020560015	Granular Borrow (Plan Quantity)	0	$17.00	Cu yd	$0	
020560025	Granular Backfill Borrow (Plan Quantity)	0	$35.19	Cu yd	$0	
020560030	Granular Backfill Borrow	0	$10.00	Ton	$0	
022210015	Remove Bridge	0	$22,594.54	each	$0	
002210080	Remove Fence	0	$1.08	ft	$0	
022210095	Remove Pipe Culvert	0	$20.00	ft	$0	
023160020	Roadway Excavation (Plan Quantity)	487	$12.00	Cu yd	$5,844	
023310020	Clearing and Grubbing	0	$2,400.00	Acre	$0	
023730010	Loose Riprap	0	$90.00	Cu yd	$0	
027210070	Untreated Base Course 3/4 inch or 1 inch Max	850	$23.50	Ton	$19,975	
027410060	HMA - 3/4 Inch	155	$110.00	Ton	$17,050	
027480010	Liquid Asphalt MC-70 or MC-250	4	$1,000.00	Ton	$4,000	
027480030	Emulsified Asphalt SS-1	0	$250.00	Ton	$0	
027520020	Portland Cement Concrete Pavement 9 inch Thick	0	$27.82	Sq yd	$0	
027710025	Concrete Curb and Gutter Type B1	0	$14.00	ft	$0	
027760010	Concrete Sidewalk	0	$20.00	Sq yd	$0	
027850030	Chip Seal Coat, Type C	0	$1.00	Sq yd	$0	
027850060	Emulsified Asphalt LMCRS-2	0	$350.00	Ton	$0	
02785008*	Flush Coat	0	$250.00	Ton	$0	
02744000*	SMA - 1/2 inch	30687	$120.00	Ton	$3,682,440	
027860020	Asphalt Cement PG 64-34	0	$200.00	Ton	$0	
028220010	Right of Way Fence, Type G (Deer Fence)	0	$4.00	ft	$0	
029120050	Strip, Stockpile, and Spread Topsoil	277200	$1.00	Sq yd	$277,200	Assumed LxW
029220010	Drill Seed	57	$470.00	Acre	$26,790	Assumed LxW
029610050	Rotomilling	0	$4.50	Sq yd	$0	
026100032	24 Inch Pipe Culvert, Class C	0	$24.79	ft	$0	
026100034	24 Inch Pipe Culvert, Class C	0	$36.14	ft	$0	
026100038	36 Inch Pipe Culvert, Class C	0	$65.72	ft	$0	
026100042	48 Inch Pipe Culvert, Class C	0	$98.02	ft	$0	
029620010	In-Place Cold Recycled Asphaltic Base	0	$2.60	Sq yd	$0	
Roadway and Drainage Subtotal					**$5,806,329**	Back to Main

Traffic, Safety & ITS - Pavement Rehabilitation (MP 19 to 27)

Back to MAIN

	Item	Quantity	Price	Units	Cost	Remarks
Traffic, Safety & ITS						
Traffic						
	W-Beam Guardrail	3240	$22.00	ft	$71,280	
	Crash Cushion Type G	11	$3,000.00	Each	$33,000	
	Concrete Barrier (New Jersey Shape)	0	$50.00	ft	$0	
	Pavement Marking Paint	204050	$0.30	ft	$61,215	
	Pavement Message Paint	0	$0.00	Each	$0	
	Signs	1	$60,000.00	Lump	$60,000	
Signals						
Lighting						
	Highway Lighting System	0	$150,000.00	Each	$0	
Traffic and Safety Subtotal					**$225,495**	
ITS						
	Multiduct Conduit	0	$50,000.00	Lump	$0	
ITS Subtotal					**$0**	Back to MAIN

Structures - Pavement Rehabilitation (MP 19 to 27)

Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Structures						
Bridges						
	Structure Maintenance	3	$100,000.00		$300,000	$100,000 per structure
Walls						
	Retaining Wall	0	$50.00	Sq ft	$0	Assumed LxH (wall area)
				ft		
Hydraulics						
	Extend Box Culvert	0	$200.00	ft	$0	
	New Box Culvert					
	Scour Mitigation					
Geotech						
	Geotech Report	1	$25,000.00	Lump	$25,000	
	Drilling	1	$25,000.00	Lump	$25,000	
Structures Subtotal					**$350,000**	Back to MAIN

Environmental and Landscaping - Pavement Rehabilitation (MP 19 to 27)

Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Environmental & Landscaping						
Environmental						
	Environmental Mitigation	0	$0.00	Lump	$0	
	Noise Wall	0	$1,000.00	ft	$0	
Temporary Erosion Control						
	Silt Fence	200	$20.00	Ft	$4,000	
	Erosion Control Supervisor	1	$20,000.00	Lump	$20,000	
	Check Dams	8	$250.00	Each	$2,000	
Landscaping						
	Contractor Furnished Topsoil			sq ft		
	Strip, Stockpile, Spread Topsoil			sq ft		
	Wood Fiber Mulch			acre		
	Broadcast Seed			acre		
	Drill Seed			acre		
Environmental Mitigation Subtotal					$26,000	

Back to MAIN

Miscellaneous - Pavement Rehabilitation (MP 19 to 27)

Back to MAIN

Item #	Item	Quantity	Price	Units	Cost	Remarks
Utilities						
	Relocate Water Line	0	$500.00	Lump	$0	
	Relocate Gas Line	0	$50,000.00	Lump	$0	
	Relocate Power Line			Lump		
	Relocate Fiber Optic			Lump		
	Relocate Phone			Lump		
	S.U.E	0	$20,000.00	Lump	$0	Assume $1.00 per foot per utility
Utilities Subtotal					**$0**	
Right-of-way						
	Urban/Suburban Residential	0	$5.00	sq ft	$0	Wasatch Front/Cache Valley/Cedar City/ Saint George areas
	Urban/Suburban Commercial	0	$15.00	sq ft	$0	Wasatch Front/Cache Valley/Cedar City/ Saint George areas
	non-Urban/Suburban Residential	0	$5.00	sq ft	$0	
	non-Urban/Suburban Commercial	0	$15.00	sq ft	$0	
	non-Urban/Suburban Farm	0	$1.00	sq ft	$0	
Right-of-Way Subtotal					**$0**	
Incentives						
	HMA Properties	0	$2.00	ton	$0	Max $2.31per ton of HMA
	Smoothness	5%	$17,050.00	lump	$853	% of HMA cost
	OGSC Properties	0	$1.75	ton	$0	Max $1.83 per ton of OGSC
	Lane Rental Incentive	0	$10,000.00	Lump	$0	
	Early Completion	1	$150,000.00	Lump	$150,000	
Incentives Subtotal					**$150,853**	
						Back to MAIN

Roadway / Pavement Summary (Activities 54C, 58C)

Project Design Criteria, as developed in the I-15 Washington County Corridor Study, is located at the end of the appendix. The following is a summary of the deficiencies located on the project.

Horizontal Alignment

The minimum horizontal curve radius for an 80 mph design speed is 3050 ft. I-15 was originally designed with a 65 mph design speed. With the increase in the speed limit several horizontal curves have become deficient. A summary of the deficient horizontal alignments and superelevations can be seen in the table below.

Deficient Horizontal Alignment

Direction	MP	Existing Radius (feet)	Existing Superelevation (e)	Notes
NB & SB	23.22	2864.93	4.9	65 mph design speed
NB & SB	23.62	2864.93	4.9	65 mph design speed

The Horizontal Alignments were not addressed in this project. These deficiencies were addressed in the Safety Improvements and Improve North and South Leads Interchange projects as identified in the I-15 Washington County Corridor Study. The curve at MP 23.62 will have a warning sign added to warn of the speed limit and the curve at MP 23.22 is recommended to be realigned due to the accident cluster located on that curve.

Vertical Alignment

Vertical Alignment deficiencies are based on sag or crest K-values. The minimum sag K-value is 231 for an 80 mph design speed and the minimum crest K-value is 384 for an 80 mph design speed. Using the as-built drawings for I-15, the vertical alignment deficiencies were determined and are summarized in the table below.

Deficient Vertical Alignment

Direction	MP	K	Notes	Type
SB	24.91	240.38	65 mph design speed	CREST
NB	26.42	255.10	65 mph design speed	CREST
NB	26.64	182.48	65 mph design speed	SAG
SB	26.67	147.1	55 mph design speed	CREST
NB	26.67	147.1	55 mph design speed	CREST

Since none of the deficient vertical alignments were associated with an accident cluster, none of the deficient vertical alignments were recommended to be realigned.

Vertical Clearance

The structure at the North Leeds Interchange currently fails to meet the 16.5 ft requirement from UDOT. No alternate route exists to bypass the structure. To correct this deficient clearance will require the grades of the cross road (Silver Reef Rd) to be realigned.

Vertical Clearance

ID	Year	Direction	MP	Clearance	Feature Crossed	Notes
1D 680	1962	NB	23.729	15’-0”	I-15 Over SR-228, Int. X-Road	Fails
3D 680	1962	SB	23.729	15’-0”	I-15 Over SR-228, Int. X-Road	Fails

The vertical clearance is to be adjusted to the appropriate standard with this project.

Clear Zone

The minimum clear zone for the project is 30 to 34 ft. Locations denoted in the tables below are deficient due to steep sideslopes or obstacles in the clear zone.

Deficient Clear Zone

Direction	From MP	To MP	Notes
NB	19.85	20.00	Steep sideslopes
NB	19.12	20.01	Steep sideslopes
SB	21.20	21.70	Steep sideslopes
NB	22.20	22.60	Steep sideslopes
NB	23.06	23.61	Steep sideslopes

Culverts in Clear zone

Direction	MP	Notes
NB & SB	26.386	Culvert in clear zone
NB & SB	26.947	Culvert in clear zone

This project will fix all clear zone issues by eliminating the obstacle, correcting the side slope, or protecting the obstacle.

Guardrail

Deficient guardrail was defined as guardrail that did not meet the height standard of 32 inches, guardrail with Texas turndown end sections, and guardrail/barrier with insufficient length of need. As a general note, no barrier offset was found at any guardrail or barrier location on the project. A summary of the deficient guardrail and length of need is located in the table below.

Insufficient length of need

Direction	MP	Notes
SB	19.50	Insufficient length of need
SB	20.36	Insufficient length of need
SB	20.80	Insufficient length of need
SB	21.21	Insufficient length of need
SB	21.97	Insufficient length of need

NB	22.93	Insufficient length of need
SB	24.38	Insufficient length of need
NB	26.54	Insufficient length of need
SB	26.54	Insufficient length of need
NB	26.64	Insufficient length of need

All guardrail on the project will be brought to standard.

Drainage
No major drainage issues were identified for this project.

Pavement Design
The pavement design will need to be provided by the region pavement engineer.

In the year 2000, major pavement rehabilitation was performed on the road. The pavement cycle requires maintenance to be completed approximately every 15 years. In order to assess when and what treatment will be needed to improve the pavement section the pavement was tested for its rideability, rutting, cracking, wheel path cracking, and skid resistance. From this data a Deighton Total Infrastructure Management System (dTIMS) Model was created to generate a pavement maintenance and rehabilitation plan. The table below summarizes the pavement condition of the project.

Pavement Condition

Direction	Begin	End	RIDE	RUT	CRCK	WPCK	SKID	dTIMS Model Recommendations
NB	19.4	27.3	81.6	85.5	100.0	88.1	57.2	High Seal 2015 and Minor Rehab 2027
SB	19.4	27.3	83.7	85.7	100.0	99.5	59.3	High Seal 2013 and Minor Rehab 2027

From the pavement condition model a remaining service life (RSL) of the pavement was determined. The RSL is based on rutting, cracking, and wheel path cracking. The RSL is typically assumed to be the lowest of the RSL. From the RSL a proposed pavement strategy was developed. The table below shows the RSL and the proposed pavement strategy.

Remaining Service Life

Direction	Begin	End	RUT RSL	Crack RSL	WCRACK RSL	Proposed Strategy
NB	19.4	27.3	19.3	30	20.9	Functional Overlay 2015 and Minor Rehab 2030
SB	19.4	27.3	19.5	30	30.0	Functional Overlay 2015 and Minor Rehab 2030

The most rigorous treatment for the 2015 functional overlay would be a 1.5" stone matrix asphalt. A 1.5" stone matrix asphalt was used as the assumed pavement section for cost estimate purposes.

Traffic and Safety Summary (Activity 64C)

An Operational safety report will need to be completed by UDOT traffic and safety. In addition to their report, a project specific analysis of corridor safety was completed by identifying locations with a project based high number of severe accidents (accidents level 3 or higher). By geographically analyzing the accident data from 2002 to 2005, accident clusters were identified by determining grouping location of severe accidents. Some of the accident clusters were also verified by comments from UDOT maintenance and public comment.

Accident Clusters

MP	Description
19.4	Located in a sag, both grades to sag about 3%. All accidents are speed related. There is also speed differential on the NB upgrade.
22.02	Poorly designed NB off ramp. The NB off ramp merges onto, instead of intersecting OLD-US 91.
23.25	Deficient curve, super is not sufficient for posted speed. The NB lanes also have deficient sight distance, there is a cut wall blocking the sight distance.

The accident clusters were not addressed in this project. The safety of the corridor was addressed in the Safety Improvements, Improve South Leeds NB-off Ramp Intersection, Improve North and South Leads Interchange, and Climbing Lane MP 20 to 21 projects as described in the I-15 Washington County Corridor Study.

The expected traffic and safety work for the project is to consist of bringing guardrail and crash cushions up to standard on the project. Also all signs need to be replaced and if necessary brought to current standard.

Structures Summary (Activity 62C)

Condition of the structure was obtained from UDOT Structure Inventory and Appraisal Sheets. The structures for this project are:

- 3E-1296; Harrisburg Creek
- 1E-1081; Harrisburg Creek
- 0D-655; South Leeds Interchange
- 1D-680; North Leeds Interchange
- 3D-680; North Leeds Interchange

Structure Inventory and Appraisal Sheet (English Units)

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	331/2	Conc Bridge Railing	(LF)	256	100 %	256	0 %	0	0 %	0	0 %	0	0 %	0

Bridge Key: 3E1296 Agency ID: 3E1296 SR: 97.6 SD/FO: ND

IDENTIFICATION

State 1: 49 Utah
Struc Num 8: 3E1296
Facility Carried 7: I-15 (SR-15) SBL
Location 9: 4.3 MI NO HARRISBURG INT
Rte.(On/Under)5A: Route On Structure
Rte. Signing Prefix 5B: 1 Interstate Hwy
Level of Service 5C: 1 Mainline
Rte. Number 5D: 00015
Directional Suffix 5E: 0 N/A
% Responsibility : 0
SHD District 2: Reg 4C
County Code 3: Washington
Place Code 4: County
Mile Post 11: 20.168 mi
Feature Intersected 6: HARRISBURG CREEK
Latitude 16: 37d 12' 26"
Longitude 17: 113d 23' 47"
Border Bridge Code 98: Not Applicable (P)
Border Bridge Number 99: NA

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0
Number of Spans Main Unit 45: 2
Main Span Material/Design 43A/B:
2 Concrete Continuous
19 Culvert
Deck Type 107: N N/A (NBI)
Wearing Surface 108A: N N/A (no deck (NBI))
Membrane 108B: N N/A (no deck (NBI))
Deck Protection 108C: N N/A (no deck (NBI))

AGE AND SERVICE

Year Built 27: 1963
Year Reconstructed 106: -4
Type of Service on 42A: 1 Highway
Type of Service under 42B: 5 Waterway
Lanes on 28A: 2
Lanes Under 28B: 0
Detour Length 19: 0.6 mi
ADT 29: 9,082
Truck ADT 109: 38 %
Year of ADT 30: 2002

GEOMETRIC DATA

Length Max Span 48: 12.1 ft
Structure Length 49: 26.9 ft
Curb/Sdwlk Width L 50A: 0.0 ft
Curb/Sidewalk Width R 50B: 0.0 ft
Width Curb to Curb 51: 0.0 ft
Width Out to Out 52: 0.0 ft
Approach Roadway Width 32: (w/ shoulders) 38.1 ft
Median 33: 1 Open median
Deck Area:
Skew 34: 0.00 °
Structure Flared 35: 0 No flare
Vertical Clearance 10: 328.05 ft
Horiz. Clearance 47: 38.06 ft
Minimum Vertical Clearance Over Bridge 53: 328.1 ft
Minimum Vertical Underclearance Reference 54A: N Feature not hwy or RR
Minimum Vertical Underclearance 54B: 0.0 ft
Minimum Lateral Underclearance Reference R 55A: N Feature not hwy or RR
Minimum Lateral Underclearance R 55: 0.0 ft
Minimum Lateral Underclearance L 56: 0.0 ft

INSPECTION

Frequency 91: 24 months
Inspection Date 90: 2/14/2007
Next Inspection: 02/14/2009
FC Frequency 92A: NA
FC Inspection Date 93A: NA
Next FC Inspection: NA
UW Frequency 92B: NA
UW Inspection Date 93B: NA
Next UW Inspection: NA
SI Frequency 92C: NA
SI Date 93C: NA
Next SI: NA
Element Frequency: 24 months
Element Inspection Date: 02/14/2007
Next Elem. Insp. Due: 02/14/2009

CLASSIFICATION

Defense Highway 100: 1 On Inter STRAHNET rte
Parallel Structure 101: Left of || bridge
Direction of Traffic 102: 1 1-way traffic
Temporary Structure 103: Not Applicable (P)
Highway System 104: 1 On the NHS
NBIS Length 112: Long Enough
Toll Facility 20: 3 On free road
Functional Class 26: 01 Rural Interstate
Defense Hwy 110: 1 On Inter STRAHNE
Historical Significance 37: 5 Not eligible for NRHP
Owner 22: 01 01 State Highway Agency
Custodian 21: 01 01 State Highway Agency

CONDITION

Deck 58: N N/A (NBI)
Super 59: N N/A (NBI)
Sub 60: N N/A (NBI)
Culvert 62: 7 Minor Deterioration
Channel/Channel Protection 61: 6 Bank Slumping

LOAD RATING AND POSTING

Inventory Rating Method 65: 2 AS Allowable Stress
Operating Rating Method 63: 2 AS Allowable Stress
Inventory Rating 66: HS19.8
Operating Rating 64: HS19.8
Design Load 31: 5 MS 18 (HS 20)
Posting 70: 5 At/Above Legal Loads
Posting status 41: A Open, no restriction

APPRAISAL

Bridge Rail 36A: N N/A or not required
Approach Rail 36C: 1 Meets Standards
Transition 36B: N N/A or not required
Approach Rail Ends 36D: 1 Meets Standards
Str. Evaluation 67: 7
Deck Geometry 68: N Not applicable (NBI)
Underclearance, Vertical and Horizontal 69: N Not applicable (NBI)
Waterway Adequacy 71: 6 Equal Minimum
Approach Alignment 72: 8 Equal Desirable Crit
Scour Critical 113: 8 Stable Above Footing

PROPOSED IMPROVEMENTS

Bridge Cost 94: $ 135,000
Type of Work 75: 31 Repl-Load Capacity
Roadway Cost 95: $ 14,000
Length of Improvement 76: 49.2 ft
Total Cost 96: $ 224,000
Future ADT 114: 11,035
Year of Cost Estimate 97: 2001
Year of Future ADT 115: 2022

NAVIGATION DATA

Navigation Control 38: N NA-no waterway
Vertical Clearance 39: 0.0 ft
Horizontal Clearance 40: 0.0 ft
Pier Protection 111: Not Applicable (P)
Lift Bridge Vertical Clearance 116: 0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	241/2	Concrete Culvert	(LF)	325	90 %	292	10 %	33	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	331/2	Conc Bridge Railing	(LF)	259	82 %	212	15 %	39	3 %	8	0 %	0	0 %	0
2	362/2	Traf Impact SmFlag	(EA)	1	100 %	1	0 %	0	0 %	0	0 %	0	0 %	0

Bridge Key: 1E1081 Agency ID: 1E1081 SR: 97.6 SD/FO: ND

IDENTIFICATION

State 1: 49 Utah Struc Num 8: 1E1081
Facility Carried 7: I-15 (SR-15) NBL Location 9: 4.3 MI.NO.HARRISBURG INT.
Rte.(On/Under)5A: Route On Structure Rte. Signing Prefix 5B: 1 Interstate Hwy
Level of Service 5C: 1 Mainline Rte. Number 5D: 00015
Directional Suffix 5E: 0 N/A % Responsibility : 0
SHD District 2: Reg 4C County Code 3: Washington
Place Code 4: County Mile Post 11: 20.168 mi
Feature Intersected 6: HARRISBURG CREEK
Latitude 16: 37d 12' 23" Longitude 17: 113d 23' 42"
Border Bridge Code 98: Not Applicable (P)
Border Bridge Number 99: NA

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 2
Main Span Material/Design 43A/B:
2 Concrete Continuous 19 Culvert
Deck Type 107: N N/A (NBI)
Wearing Surface 108A: N N/A (no deck (NBI))
Membrane 108B: N N/A (no deck (NBI))
Deck Protection 108C: N N/A (no deck (NBI))

AGE AND SERVICE

Year Built 27: 1956 Year Reconstructed 106: -4
Type of Service on 42A: 1 Highway
Type of Service under 42B: 5 Waterway
Lanes on 28A: 2 Lanes Under 28B: 0 Detour Length 19: 0.6 mi
ADT 29: 9,083 Truck ADT 109: 36 % Year of ADT 30: 2002

GEOMETRIC DATA

Length Max Span 48: 18.0 ft Structure Length 49: 39.0 ft
Curb/Sdwlk Width L 50A: 0.0 ft Curb/Sidewalk Width R 50B: 0.0 ft
Width Curb to Curb 51: 0.0 ft Width Out to Out 52: 0.0 ft
Approach Roadway Width 32: (w/ shoulders) 38.1 ft Median 33: 1 Open median
Deck Area:
Skew 34: 0.00 ° Structure Flared 35: 0 No flare
Vertical Clearance 10: 328.05 ft Horiz. Clearance 47: 38.06 ft
Minimum Vertical Clearance Over Bridge 53: 328.1 ft
Minimum Vertical Underclearance Reference 54A: N Feature not hwy or RR
Minimum Vertical Underclearance 54B: 0.0 ft
Minimum Lateral Underclearance Reference R 55A: N Feature not hwy or RR
Minimum Lateral Underclearance R 55: 0.0 ft
Minimum Lateral Underclearance L 56: 0.0 ft

INSPECTION

Frequency 91: 24 months Inspection Date 90: 2/14/2007 Next Inspection: 02/14/2009
FC Frequency 92A: NA FC Inspection Date 93A: NA Next FC Inspection: NA
UW Frequency 92B: NA UW Inspection Date 93B: NA Next UW Inspection: NA
SI Frequency 92C: NA SI Date 93C: NA Next SI: NA
Element Frequency: 24 months Element Inspection Date: 02/14/2007 Next Elem. Insp. Due: 02/14/2009

CLASSIFICATION

Defense Highway 100: 1 On Inter STRAHNET rte Parallel Structure 101: Right of || bridge
Direction of Traffic 102: 1 1-way traffic Temporary Structure 103: Not Applicable (P)
Highway System 104: 1 On the NHS NBIS Length 112: Long Enough
Toll Facility 20: 3 On free road Functional Class 26: 01 Rural Interstate
Defense Hwy 110: 1 On Inter STRAHNE Historical Significance 37: 5 Not eligible for NRHP
Owner 22: 01 01 State Highway Agency
Custodian 21: 01 01 State Highway Agency

CONDITION

Deck 58: N N/A (NBI) Super 59: N N/A (NBI) Sub 60: N N/A (NBI)
Culvert 62: 7 Minor Deterioration Channel/Channel Protection 61: 6 Bank Slumping

LOAD RATING AND POSTING

Inventory Rating Method 65: 2 AS Allowable Stres Operating Rating Method 63: 2 AS Allowable Stress
Inventory Rating 66: HS19.8 Operating Rating 64: HS19.8
Design Load 31: 5 MS 18 (HS 20) Posting 70: 5 At/Above Legal Loads
Posting status 41: A Open, no restriction

APPRAISAL

Bridge Rail 36A: N N/A or not required Approach Rail 36C: 1 Meets Standards
Transition 36B: N N/A or not required Approach Rail Ends 36D: 1 Meets Standards
Str. Evaluation 67: 7 Deck Geometry 68: N Not applicable (NBI)
Underclearance, Vertical and Horizontal 69: N Not applicable (NBI)
Waterway Adequacy 71: 6 Equal Minimum Approach Alignment 72: 8 Equal Desirable Crit
Scour Critical 113: 8 Stable Above Footing

PROPOSED IMPROVEMENTS

Bridge Cost 94: $ 169,000 Type of Work 75: 31 Repl-Load Capacity
Roadway Cost 95: $ 17,000 Length of Improvement 76: 62.3 ft
Total Cost 96: $ 279,000 Future ADT 114: 11,036
Year of Cost Estimate 97: 2001 Year of Future ADT 115: 2022

NAVIGATION DATA

Navigation Control 38: N NA-no waterway
Vertical Clearance 39: 0.0 ft Horizontal Clearance 40: 0.0 ft
Pier Protection 111: Not Applicable (P) Lift Bridge Vertical Clearance 116: 0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	241/2	Concrete Culvert	(LF)	266	100 %	266	0 %	0	0 %	0	0 %	0	0 %	0
2	361/2	Scour Smart Flag	(EA)	1	0 %	0	100 %	1	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 0D 665 Agency ID: 0D 665 SR: 69.5 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	0D 665
Facility Carried 7:	SR-228,INTER X-RD	Location 9:	SOUTH LEEDS INTERCHANGE
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	3 State Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00228
Directional Suffix 5E:	0 N/A	% Responsibility :	NA
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	Leeds town	Mile Post 11:	0.040 mi
Feature Intersected 6:	I-15 (SR-15) NBL & SBL		
Latitude 16:	37d 14' 03"	Longitude 17:	113d 22' 08"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	0 Not a STRAHNET hwy	Parallel Structure 101:	No || bridge exists
Direction of Traffic 102:	2 2-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	0 Not on NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	09 Rural Local
Defense Hwy 110:	0 Not a STRAHNET	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 4

Main Span Material/Design 43A/B:

2 Concrete Continuous 04 Tee Beam

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	0 None
Deck Protection 108C:	None

CONDITION

Deck 58:	7 Good	Super 59:	7 Good	Sub 60:	7 Good
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:		N N/A (NBI)	

LOAD RATING AND POSTING

Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress
Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

AGE AND SERVICE

Year Built 27:	1962	Year Reconstructed 106:	-4		
Type of Service on 42A:	1 Highway				
Type of Service under 42B:	1 Highway				
Lanes on 28A:	2	Lanes Under 28B:	4	Detour Length 19:	123.7 m
ADT 29:	1,930	Truck ADT 109:	2 %	Year of ADT 30:	2002

APPRAISAL

Bridge Rail 36A:	1 Meets Standards	Approach Rail 36C:	1 Meets Standards
Transition 36B:	1 Meets Standards	Approach Rail Ends 36D:	1 Meets Standards
Str. Evaluation 67:	7	Deck Geometry 68:	5 Above Tolerable
Underclearance, Vertical and Horizontal 69:	4 Tolerable		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	6 Equal Min Criteria
Scour Critical 113:	N Not Over Waterway		

GEOMETRIC DATA

Length Max Span 48:	58.1 ft	Structure Length 49:	217.8 ft
Curb/Sdwlk Width L 50A:	2.0 ft	Curb/Sidewalk Width R 50B:	2.0 ft
Width Curb to Curb 51:	27.9 ft	Width Out to Out 52:	34.1 ft
Approach Roadway Width 32: (w/ shoulders)	27.9 ft	Median 33:	0 No median
Deck Area:	7,437.9 sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	27.89 ft
Minimum Vertical Clearance Over Bridge 53:	328.1 ft		
Minimum Vertical Underclearance Reference 54A:	H Hwy beneath struct		
Minimum Vertical Underclearance 54B:	17.0 ft		
Minimum Lateral Underclearance Reference R 55A:	H Hwy beneath struct		
Minimum Lateral Underclearance R 55:	10.2 ft		
Minimum Lateral Underclearance L 56:	13.5 ft		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 639,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 64,000	Length of Improvement 76:	252.6 ft
Total Cost 96:	$ 1,055,000	Future ADT 114:	2,345
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	14/3	P Conc Deck/AC Ovly	(SF)	5,759	100 %	5,759	0 %	0	0 %	0	0 %	0	0 %	0
2	110/2	R/Conc Open Girder	(LF)	804	99 %	797	1 %	7	0 %	0	0 %	0	0 %	0
2	205/2	R/Conc Column	(EA)	6	100 %	6	0 %	0	0 %	0	0 %	0	0 %	0
2	215/2	R/Conc Abutment	(LF)	66	100 %	66	0 %	0	0 %	0	0 %	0	0 %	0
2	234/2	R/Conc Cap	(LF)	85	100 %	85	0 %	0	0 %	0	0 %	0	0 %	0
2	313/3	Fixed Bearing	(EA)	20	100 %	20	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	321/3	R/Conc Approach Slab	(SF)	8,622	100 %	8,622	0 %	0	0 %	0	0 %	0	0 %	0
2	331/3	Conc Bridge Railing	(LF)	436	99 %	433	0 %	0	1 %	3	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 1D 680 Agency ID: 1D 680 SR: 95.6 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	1D 680
Facility Carried 7:	I-15 (SR-15) NBL	Location 9:	NORTH LEEDS INTERCHANGE
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	0
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	Leeds town	Mile Post 11:	23.703 mi
Feature Intersected 6:	SR-228, INTCHG. X-ROAD		
Latitude 16:	37d 14' 38"	Longitude 17:	113d 21' 12"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 3

Main Span Material/Design 43A/B:

2 Concrete Continuous 04 Tee Beam

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	0 None
Deck Protection 108C:	None

AGE AND SERVICE

Year Built 27:	1962	Year Reconstructed 106:	-4
Type of Service on 42A:	1 Highway		
Type of Service under 42B:	1 Highway		
Lanes on 28A:	2	Lanes Under 28B:	2
Detour Length 19:	0.6 mi		
ADT 29:	8,154	Truck ADT 109:	36 %
Year of ADT 30:	2002		

GEOMETRIC DATA

Length Max Span 48:	38.1 ft	Structure Length 49:	104.0 ft
Curb/Sdwlk Width L 50A:	0.0 ft	Curb/Sidewalk Width R 50B:	0.0 ft
Width Curb to Curb 51:	38.1 ft	Width Out to Out 52:	41.3 ft
Approach Roadway Width 32: (w/ shoulders)	38.1 ft	Median 33:	1 Open median
Deck Area:	4,294.8 sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft

Minimum Vertical Clearance Over Bridge 53:	328.1 ft
Minimum Vertical Underclearance Reference 54A:	H Hwy beneath struct
Minimum Vertical Underclearance 54B:	15.0 ft
Minimum Lateral Underclearance Reference R 55A:	H Hwy beneath struct
Minimum Lateral Underclearance R 55:	5.6 ft
Minimum Lateral Underclearance L 56:	0.0 ft

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	Right of || bridge
Direction of Traffic 102:	1 1-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNI	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

CONDITION

Deck 58:	7 Good	Super 59:	7 Good	Sub 60:	7 Good
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:		N N/A (NBI)	

LOAD RATING AND POSTING

Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress
Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	1 Meets Standards	Approach Rail 36C:	1 Meets Standards
Transition 36B:	1 Meets Standards	Approach Rail Ends 36D:	1 Meets Standards
Str. Evaluation 67:	7	Deck Geometry 68:	6 Equal Min Criteria
Underclearance, Vertical and Horizontal 69:	4 Tolerable		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 367,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 37,000	Length of Improvement 76:	131.2 ft
Total Cost 96:	$ 606,000	Future ADT 114:	9,907
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	14/2	P Conc Deck/AC Ovly	(SF)	3,961	100 %	3,961	0 %	0	0 %	0	0 %	0	0 %	0
2	110/1	R/Conc Open Girder	(LF)	518	100 %	518	0 %	0	0 %	0	0 %	0	0 %	0
2	205/2	R/Conc Column	(EA)	6	100 %	6	0 %	0	0 %	0	0 %	0	0 %	0
2	215/2	R/Conc Abutment	(LF)	85	100 %	85	0 %	0	0 %	0	0 %	0	0 %	0
2	234/1	R/Conc Cap	(LF)	75	100 %	75	0 %	0	0 %	0	0 %	0	0 %	0
2	321/2	R/Conc Approach Slab	(SF)	1,152	100 %	1,152	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	331/2	Conc Bridge Railing	(LF)	240	100 %	240	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Bridge Key: 3D 680 Agency ID: 3D 680 SR: 95.6 SD/FO: ND

IDENTIFICATION

State 1:	49 Utah	Struc Num 8:	3D 680
Facility Carried 7:	I-15 (SR-15) SBL	Location 9:	NORTH LEEDS INTERCHANGE
Rte.(On/Under)5A:	Route On Structure	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00015
Directional Suffix 5E:	0 N/A	% Responsibility :	0
SHD District 2:	Reg 4C	County Code 3:	Washington
Place Code 4:	Leeds town	Mile Post 11:	23.703 mi
Feature Intersected 6:	SR-228, INTCHG. X-ROAD		
Latitude 16:	37d 14' 40"	Longitude 17:	113d 21' 12"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	NA		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 3

Main Span Material/Design 43A/B:

2 Concrete Continuous 04 Tee Beam

Deck Type 107:	1 Concrete-Cast-in-Place
Wearing Surface 108A:	6 Bituminous
Membrane 108B:	2 Preformed Fabric
Deck Protection 108C:	None

AGE AND SERVICE

Year Built 27:	1962	Year Reconstructed 106:	-4
Type of Service on 42A:	1 Highway		
Type of Service under 42B:	1 Highway		
Lanes on 28A:	2	Lanes Under 28B:	2
Detour Length 19:	0.6 mi		
ADT 29:	8,328	Truck ADT 109:	38 %
Year of ADT 30:	2002		

GEOMETRIC DATA

Length Max Span 48:	38.1 ft	Structure Length 49:	104.0 ft
Curb/Sdwlk Width L 50A:	0.0 ft	Curb/Sidewalk Width R 50B:	0.0 ft
Width Curb to Curb 51:	38.1 ft	Width Out to Out 52:	41.3 ft
Approach Roadway Width 32: (w/ shoulders)	38.1 ft	Median 33:	1 Open median
Deck Area:	4,294.8 sq. ft		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Vertical Clearance 10:	328.05 ft	Horiz. Clearance 47:	38.06 ft

Minimum Vertical Clearance Over Bridge 53:	328.1 ft
Minimum Vertical Underclearance Reference 54A:	H Hwy beneath struct
Minimum Vertical Underclearance 54B:	15.0 ft
Minimum Lateral Underclearance Reference R 55A:	H Hwy beneath struct
Minimum Lateral Underclearance R 55:	5.6 ft
Minimum Lateral Underclearance L 56:	0.0 ft

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	2/14/2007	Next Inspection:	02/14/2009
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	02/14/2007	Next Elem. Insp. Due:	02/14/2009

CLASSIFICATION

Defense Highway 100:	1 On Inter STRAHNET rte	Parallel Structure 101:	Left of || bridge
Direction of Traffic 102:	1 1-way traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	1 On the NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	01 Rural Interstate
Defense Hwy 110:	1 On Inter STRAHNI	Historical Significance 37:	5 Not eligible for NRHP
Owner 22:	01 01 State Highway Agency		
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CONDITION

Deck 58:	7 Good	Super 59:	7 Good	Sub 60:	7 Good
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:		N N/A (NBI)	

LOAD RATING AND POSTING

Inventory Rating Method 65:	2 AS Allowable Stress	Operating Rating Method 63:	2 AS Allowable Stress
Inventory Rating 66:	HS19.8	Operating Rating 64:	HS19.8
Design Load 31:	5 MS 18 (HS 20)	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	1 Meets Standards	Approach Rail 36C:	1 Meets Standards
Transition 36B:	1 Meets Standards	Approach Rail Ends 36D:	1 Meets Standards
Str. Evaluation 67:	7	Deck Geometry 68:	6 Equal Min Criteria
Underclearance, Vertical and Horizontal 69:	4 Tolerable		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	8 Equal Desirable Crit
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 367,000	Type of Work 75:	31 Repl-Load Capacity
Roadway Cost 95:	$ 37,000	Length of Improvement 76:	131.2 ft
Total Cost 96:	$ 606,000	Future ADT 114:	10,119
Year of Cost Estimate 97:	2001	Year of Future ADT 115:	2022

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.0 ft	Horizontal Clearance 40:	0.0 ft
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	0.0 ft

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	13/2	Unp Conc Deck/AC Ovl	(SF)	3,961	100 %	3,961	0 %	0	0 %	0	0 %	0	0 %	0
2	110/1	R/Conc Open Girder	(LF)	518	99 %	512	1 %	7	0 %	0	0 %	0	0 %	0
2	205/1	R/Conc Column	(EA)	6	83 %	5	17 %	1	0 %	0	0 %	0	0 %	0
2	215/2	R/Conc Abutment	(LF)	85	100 %	85	0 %	0	0 %	0	0 %	0	0 %	0
2	234/1	R/Conc Cap	(LF)	75	100 %	75	0 %	0	0 %	0	0 %	0	0 %	0
2	312/1	Enclosed Bearing	(EA)	10	100 %	10	0 %	0	0 %	0	0 %	0	0 %	0

Structure Inventory and Appraisal Sheet (English Units)

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	321/2	R/Conc Approach Slab	(SF)	1,152	100 %	1,152	0 %	0	0 %	0	0 %	0	0 %	0
2	331/2	Conc Bridge Railing	(LF)	240	100 %	240	0 %	0	0 %	0	0 %	0	0 %	0

The structural plan is to perform preventive maintenance treatments to all structures on the project. The work items that will need to be completed as part of the preventative maintenance are:

- Asphalt surfacing removal (structures)
- Pothole patching (deck only)
- Waterproofing membrane (deck and approach slabs)
- 2" hot mix asphalt overlay
- 1" open graded surface course
- Seal parapets
- Joint replacement

Environmental Summary (Activity 52C)

A categorical exclusion is the expected level of environmental documentation for the project.

Cultural and Paleontological

Archeological studies have been performed on almost all of the project area. There were a significant number of documented cultural sites from those surveys of the project, including some eligible sites. To see a list of surveys and list of eligible sites, see the environmental section of the I-15 Washington County Corridor Study Technical Reports.

Wetlands

No wetlands impacts are anticipated. Proper erosion control including rip rap, vegetation, and other techniques should be used throughout the project.

Environmental

Virgin Spinedace – The Virgin Spinedace is found in the Santa Clara River, Virgin River, and Quail Creek (MP 20.2). Peak spawning season is from April 1 to June 30. Potential spawning in response to monsoon induced storm peaks in late July – September. Fish clearance is recommended prior to any in stream construction.

Dwarf Bearclaw Poppy - Potential habitat exists between MP 1-6 and 18-25. There is no critical habitat designated for this species. An existing population's map is available. The Dwarf Bearclaw Poppy flowers between mid-April to May, with the survey season in May.

Holmgren Milkvetch - Potential habitat exists between MP 1-6 and 18-25. Designated critical habitat is between MP 1-2. Critical habitat map and existing populations map are available. The Holmgren Milkvetch flowers between March and April with fruits by the end of April and pods that persist until end of May. Survey season is in May.

Shivwits Milkvetch - Potential habitat between MP 18-25 with critical habitat designated within the same area. There is no map available of the critical habitat. However an existing population's map is available. The Shivwits Milkvetch flowers between April and late May, by the end of June most of the plants dry up. Survey season is in May.

Desert Tortoise - Potential tortoise habitat is between MP 1-5 & MP 13-22. The Red Cliffs Desert Preserve is on north side of I-15 between MP 13.5 – 21.5. Designated critical habitat between MP 13.5-20

exists inside of the I-15 rights-of way. A map showing the designated critical habitat and preserve is available. Also a Habitat Conservation Plan is available for this species. A Presence/absence survey can be completed anytime. Clearance of tortoise is required during active season. Active season is from March 15 to October 15.

Desert Sucker – Is a state species of concern and is known to occur in the tributaries of Quail Creek.

Right of Way Summary (Activity 56C)

No right-of-way impacts expected.

Utility and Railroad Summary (Activity 68C)

No utility or railroad conflicts identified.

ITS Summary (Activity 66C)

No ITS implementation on this project.

Public Involvement Summary (Activity 60C)

The public involvement plan is to coordinate with local municipalities, Port of Entry, Truckers Association, Tourism Bureau, and local media, on project construction schedule and traffic impacts.

PROJECT DESIGN CRITERIA

I. PROJECT DESCRIPTION

Date: January 17, 2008

Project Name	**I-15 Corridor Study, Washington County MP 0 to 42**		
Project Number	**S-R499(48)**	PIN	**6361**

Describe the scope of the project: A corridor study for I-15 from the Arizona State Line (MP 0) in Washington County to the New Harmony Interchange (MP 42) in Washington County. The purpose of the project is to identify corridor needs and constraints, provide solutions, prioritize and develop a schedule for implementing those solutions, and provide concept reports for immediate projects. Projects identified will be included on the STIP. The time period for the corridor study includes analysis for the current year 2007 and the next 30 years (2040).

II. DESIGN STANDARDS BY ROADWAY (complete for each roadway on your project)

ROADWAY: I-15, MP 0.0 to MP 11.5

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**70 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	70 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft								
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504-505 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	2040 ft			Mainline					

I-15, MP 0.0 to MP 11.5 (continued)

12 Critical Elements	UDOT Standard			Proposed			Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value		Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Mainline	181	247	Mainline				
Profile Grades	% Min		% Max	% Min		% Max		AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5					
Stopping-Sight Distance	Minimum			Minimum				AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	730 ft		Mainline				
Cross Slope	Minimum							AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%							
Superelevation	Maximum Superelevation (UDOT Standard)							UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%							
Structural Capacity	Design Loading							Reference roadway design MOI, pg 288
	HS20 existing bridges HL-93 new structures							
Vertical Clearance*	Minimum							UDOT Roadway Design MOI p. 64
	16 feet 6 inches							
Bridge Width	Minimum							UDOT Roadway Design MOI p. 63
	Add 2 ft to travel way to each side of bridge							

I-15, MP 0.0 to MP 11.5 (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: I-15, MP 11.5 to MP 42

Roadway Characteristics:

Functional Class	**Freeway**		Design Speed	**80 mph**	Terrain	**varies**
Current Year	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed				Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location					AASHTO GB p. 503 UDOT Roadway Design MOI p. 65
	Mainline	80 mph			Mainline					
Lane Width	Minimum				Mainline					UDOT Roadway Design MOI p. 63 AASHTO GB p. 504
	Mainline	12 ft				.				
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset			AASHTO GB p. 504 Assume high truck traffic
	Mainline	4-8 ft	12 ft	2 ft						
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values					AASHTO GB p. 168
	Mainline	3050 ft			Mainline					
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value			AASHTO GB p. 272 & 277
	Mainline	231	384		Mainline					
Profile Grades	% Min		% Max		% Min		% Max			AASHTO Page 506,Exhibit 8-1, UDOT Roadway Design MOI pg. 122
	0.20%		3-5							
Stopping-Sight Distance	Minimum				Minimum					AASHTO GB p. 126, 112 Exhibit 3-1
	Mainline	910 ft			Mainline					
Cross Slope	Minimum									AASHTO GB Page 504 UDOT STD DWG DD 4 shows normal crown of 2%
	2.0%									
Superelevation	Maximum Superelevation (UDOT Standard)									UDOT Roadway Design MOI p. 88 AASHTO GB p. 168
	6%									

I-15, MP 11.5 to MP 42

12 Critical Elements	UDOT Standard	Proposed	Is a Design Exception Needed & approved?	Comment (References, alignment, mitigation, etc.)
Structural Capacity	Design Loading HS20 existing bridges HL-93 new structures			Reference roadway design MOI, pg 288
Vertical Clearance*	Minimum 16 feet 6 inches			UDOT Roadway Design MOI p. 64
Bridge Width	Minimum Add 2 ft to travel way to each side of bridge			UDOT Roadway Design MOI p. 63

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	30 ft to 34 ft (not in roadside table)			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1
Ramp Terminal Sight Distance	N/A			
Ramp Design	N/A			
Gores	N/A			
Ramp Terminals	N/A			
Ramp Entrances	N/A			
Acceleration Lanes	N/A			
Ramp Exits	N/A			
Deceleration Lanes	N/A			
Guardrail Bridge Connection	N/A			
Sideslopes	N/A			
Intersection Sight Distance	N/A			
Shoulder/Travel way (gutter pan)	N/A			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	N/A			

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General Off Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	% Trucks =	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General Off Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Horizontal Clearance	40 mph or less 14 ft to 16 ft 50 mph 18 ft to 20 ft			AASHTO Roadside Design Guide Table 3.1 Assume using 6:1 sideslope
Ramp Terminal Sight Distance	25 mph – 155 ft			AASHTO GB p. 828
Ramp Design	UDOT STD DWG DD 6			AASHTO GB p. 825+
Gores	UDOT STD DWG DD 6			AASHTO GB p. 832-837
Ramp Terminals	UDOT STD DWG DD 6			AASHTO GB p. 840-845
Ramp Entrances	UDOT STD DWG DD 6			AASHTO GB p. 845
Acceleration Lanes	AASHTO p. 847, 848			
Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General Off Ramp (continued)

14 Design Waivers	UDOT Standard	Proposed	Design Waiver needed & Approved	Comments (references, alignment, mitigation, etc.)
Guardrail Bridge Connection	N/A			
Sideslopes	6:1 in clear zone			UDOT STD DWG DD 4 AASHTO GB p. 326-329
Intersection Sight Distance	UDOT Roadway Design MOI p. 127-128 AASHTO GB p. 650-677			
Shoulder/Travel way (gutter pan)	Gutter pan not included in travelway or shoulder			UDOT Roadway Design MOI p. 63, 104
Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

ROADWAY: General On Ramp

Roadway Characteristics:

Functional Class	**Ramp**		Design Speed	**Varies**	Terrain	**Varies**
Current Year 2007	AADT =	**2007**	DHV =	**See attached**	**See attached**	**See attached**
Design Year 2015	AADT =	**2040**	DHV =	**See attached**		
Design Vehicle	**WB-67**		Number of Lanes	**Varies**		

Design Standards:

12 Critical Elements	UDOT Standard				Proposed			Is a Design Exception Needed & approved?	Standard Reference / Comment (References, alignment, mitigation, etc.)
Design Speed		Range			Location				AASHTO GB p. 825-826 UDOT Roadway Design MOI p. 65
	Ramp	Termini 25 mph Body 40 mph Gore 50 mph			Ramp				
Lane Width	Minimum				Ramps				UDOT STD DWG DD 4
	Ramps	14 ft (1 lane) 12 ft (2+ lanes)							
Shoulder Width		Inside	Outside	Barrier Offset	Inside	Outside	Barrier Offset		UDOT STD DWG DD 4 AASHTO GB p. 838 to 840
	Ramp	4 ft	6 ft (1 ln) 8 ft (2 + ln)	2 ft					
Horizontal Alignment	Minimum Radii Values				Minimum Radii Values				AASHTO GB p. 168
	Ramp	25 mph – 144 ft 40 mph – 485 ft 50 mph – 833 ft			Ramp				
Vertical Alignment*		Sag Curve Minimum K Value	Crest Curve Minimum K Value			Sag Curve Minimum K Value	Crest Curve Minimum K Value		AASHTO GB p. 272 & 277
	Ramp	25 mph- 26 40 mph- 64 50 mph- 96	25 mph- 12 40 mph- 44 50 mph- 84		Ramp				
Profile Grades	% Min		% Max		% Min		% Max		AASHTO GB p. 828 to 829 UDOT Roadway Design MOI pg. 122
	No curb 0.2 with adequate crown		25 mph – 7 40 mph – 6 50 mph – 5						

ROADWAY: General On Ramp (continued)

12 Critical Elements	UDOT Standard		Proposed		Is a Design Exception Needed & approved?	Standard Reference Comment (References, alignment, mitigation, etc.)
Stopping-Sight Distance	Minimum		Minimum			AASHTO GB p. 112 & 828 Exhibit 3-1
	Ramp	25 mph - 155 ft 40 mph - 305 ft 50 mph - 425 ft	Ramp			
Cross Slope	Minimum					UDOT STD DWG DD 4 shows normal crown 2% AASHTO GB p. 829 to 830
	2%					
Superelevation	Maximum Superelevation (UDOT Standard)					UDOT Roadway Design MOI p. 88 AASHTO GB p. 168 & 829 to 832
	6%					
Structural Capacity	Design Loading					
	N/A					
Vertical Clearance*	Minimum					
	N/A					
Bridge Width	Minimum					
	N/A					

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Ramp Exits	UDOT STD DWG DD 6			AASHTO GB p. 849
Deceleration Lanes	AASHTO p. 851			

ROADWAY: General On Ramp (continued)

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Curb Configuration	UDOT STD DWG GW 2			UDOT STD DWG GW 2 AASHTO GB p. 320-322

* Notify FHWA on any changes to Vertical Clearance on Freeways or on the National Highway System.

Prepared by:_____ Phone Number:_____

Verified Only - Region Preconstruction Engineer:_____ Date:_____

Approved by Region Preconstruction Engineer, Consulting Engineer,
or Local Government Engineer:_____ Date:_____

Required Signatures

Local government projects require Regional Preconstruction Engineer signature for verification and the Local Government Engineer signature for approval.
Local government projects on State highway system require the Region Preconstruction Engineer signature for approval.
All other projects require Region Preconstruction Engineer signature for approval.


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BIG 5
OLD NAVY
Red Lobster
STAPLES
chili's